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Procedure in Suspected Lightning Cases.*

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I may say I received a great shock when I saw on the agenda that I was supposed to put forward a suggested scheme of procedure in suspected lightning cases.

I have no data as to occurrence, and am purely guided by memory and observations. I do believe, however, that certain districts are more prone than others to losses from this cause. As to local conditions influencing this, I know none beyond the meteorological factor, and that some parts of the country have a greater rainfall.

It has occurred to me that certain subsoils may possess a greater power of conductivity, *e.g.*, iron-stone lands and also the heavily-wooded districts.

With your permission, I propose now to say a few words on the legal aspect of the subject. Differences of opinion on any subject do, and must always, exist. This is progressive and healthy, but in the case of lightning I venture to say the discrepancy of opinion is much too wide, and as a profession I think a more uniform standard would be for the well-being of our own reputation—individually and collectively.

I think I am quite safe in saying that losses of livestock from lightning strike are covered by insurance in 99 per cent. of cases, hence our opinion may be required for legal purposes, *i.e.*, if an insurance policy may be considered a legal document the utmost care should be exercised in arriving at a conclusion and giving an opinion.

The terms of an insurance policy are such that the onus of proof rests upon the insured to establish his claim. It is no business of the insurance company to disprove loss by death or injury from lightning. As a matter of fact, what do we find? The position to-day is that many reputable companies give the most lenient interpretation to the clause, and the insured is given the benefit of any reasonable doubt. To be more precise, many insurance companies accept liability if *post-mortem* findings are negative, *i.e.*, if no pathological lesion or lesions are present sufficient to cause death.

How many of those present would care to go into a court of law and say in every case in which we give a certificate "This is a case of lightning"? I am afraid, if such were the case, fewer claims would be paid.

The leniency displayed by insurance companies is purely on competitive grounds, in order to create a good impression, and is really a form of advertisement.

Human nature being what it is, stock owners are not slow to recognise this elasticity in the interpretation of their policies, a factor responsible for many frivolous claims, some of which are successful.

Would it be fair to ask how far this attitude reacts upon the practitioner when he knows full well that the insurance company is only too willing to pay? I know at least one reputable company which rarely employs a veterinary surgeon to make a *post-mortem* examination. This is done by the local agent, and if he is in doubt he calls in a veterinary surgeon. Obvious cases, of course, cause no trouble, *i.e.*, meteorological, singeing with death, etc.

Here I will interpose a remark by saying that some insurance companies ask such definite questions as to the existence of a smell of sulphur, singeing, *rigor mortis* being incomplete, the blood dark and tarry and early putrefaction.

It is the indefinite case in which I seek your advice, as the obvious case with singeing constitutes only a small percentage of the cases reported as lightning.

I am quite convinced that many cases of lightning do occur without burns, and may or may not cause death; consequently, I am going to suggest that one or two conditions should be present before giving a certificate:—

(1) Meteorological conditions should be consistent with a claim.

(2) Singeing with or without death.

(3) In cases of death where no pathological lesions can be found and No. 1 condition is present, we may state that the case *may* be one of lightning.

In cases where death does not occur, and where No. 1 condition is present and where the animal shows very definite interferences with co-ordination with or without central nervous disturbances, I would suggest treatment be given, *viz.*, time.

If the patient has to be destroyed, and a *post-mortem* becomes necessary and no lesions are found I think our imagination might be sufficiently elastic to certify the case as probably a case of lightning, being careful to state the absence of pathological lesions.

In all other cases, *i.e.*, where pathological lesions are present, I do feel we are not justified in giving expression to the opinion that lightning was the cause of death or illness. It may make it much clearer if I give a few illustrations of cases which I have seen as reported lightning, and many of them certified—nephritis, ruptured stomach, tuberculous meningitis, luxation of the hip with rupture of the round ligament, fractured femur, tetanus, tuberculosis with emaciation, blackleg, milk fever.

In cases where death does not take place, and temporary or permanent depreciation occurs, one must be careful in ascertaining a clear history. This must be consistent with a storm, and show definite nervous disturbances in a varying degree, also we must satisfy ourselves as far as possible that such disturbances are purely functional.

It is sometimes assumed that injuries are a result of the animal having been frightened by a storm, although no definite evidence is forthcoming that it was definitely struck. These cases are very difficult.

* Paper presented to the Lancashire Division, N.V.M.A., at Manchester, October 23rd, 1931.

DEPT. OF VET. MEDICINE

I am looking forward to the time when a more definite means of diagnosis will be available. Perhaps it is not too much to hope that our laboratory confrères may help by ascertaining if any tissue changes take place which are specific to electric shock, other than the macroscopic.

I have nothing further to add, although fully alive to the inefficiency of these notes. I hope you will elaborate upon them by submitting further information and criticisms where necessary, and if we arrive at a more definite standard I, for one, will be pleased.

Discussion.

Mr. J. Holroyd, in opening the discussion, said that he really did not know why the Council asked him to do so, and had he been present at the last Council meeting he should have wanted to decline, chiefly because, fortunately, they did not have many lightning cases in their district. However, the subject of lightning shock was one of such a debatable character (and one, moreover, of no little importance to country practitioners) that he felt bound to comply with the Council's request.

In the first place, he would like to congratulate Mr. Procter on his courage in tackling such a subject. He had dealt with it in a very practical manner and the manner in which it was met with in every district. He (the speaker) agreed with practically all the essayist had said in his paper and any criticism that he had to offer must be taken as being of a constructive and not a destructive nature.

In 1927, at the N.V.M.A. meeting in Torquay, Mr. S. J. Motton read a paper on "Lightning and Electric Shock in Animals," which he thought well worth anyone's perusal. Since he got the notes from Mr. Procter he looked up that paper and read it over again, and he would now quote from it freely. "Lightning occurs in three forms," proceeded Mr. Holroyd, "fire-balls, sheet lightning and linear lightning (fork lightning). The last is the form which causes most damage both to animals and to inanimate things. It is said that lightning is the visible discharge of electricity and in the case of the linear form is a strong clear flash which shoots from cloud to earth, earth to cloud or from cloud to cloud. Anything which helps to conduct this electricity either from cloud to earth or earth to cloud is 'struck' as we term it. It is estimated that the voltage of lightning is in the region of about a million volts: anything that gets in the path of the electric current therefore receives a shock of about a million volts. I find in my district that the geological nature of the soil has a certain bearing on the incidence of lightning. In rocky districts they do not get it. According to Motton's paper, loam, sand, clay, marble and chalk, in the order named, are soils that predispose to it. Certain trees are more often struck than others and, it is stated, in the following order of frequency: poplar, oak, elm, conifer, walnut, ash and beech. Frequently one finds animals killed with lightning in the middle of a flat field, and a possible explanation of this is what is called *Choc de retour*, that is, where lightning passes from the cloud to earth, then through the earth for some considerable distance, may be a mile or half-a-mile away."

Mr. Holroyd said that he was in entire agreement with Mr. Procter in regard to his described divergent views of the members of the profession in giving certificates for lightning. There were some members who must have seen external visible singeing before giving a certificate and, on the other hand, there were those who were persuaded, from what they had been told by the farmer, that the animal had died from lightning. Probably the man who took the middle course was correct.

In regard to symptoms, Mr. Holroyd considered the following to be the order of their importance:—external visible singe marks: positive meteorological conditions: proximity to trees, fences, wires, etc.: negative anthrax (microscopic): black tarry blood: petechiæ: putrefaction: early and transient *rigor mortis*. In the absence of any pathological conditions and provided the history of the case both as regards the animal and weather was consistent, he thought one was justified in giving a certificate that lightning had been the cause of the animal's death. The cases that presented very great difficulty to him were those where the animal was not dead but showed some sort of nervous symptoms which the owner alleged were due to lightning. One could not say definitely that lightning was the cause, and yet at the same time how many identical cases did one see that were in no way connected with lightning? He had come to the conclusion that there were nine cases which might have been due to lightning, if there had been any, to one that was attributed to lightning when there had been lightning.

Mr. Procter had not, he thought, mentioned anything about laboratory methods.

As the time was getting on he trusted that those few remarks would fulfil what the President had asked of him, *viz*, to start the ball rolling. He felt sure that every member present, especially those in agricultural districts, would add to the discussion and so reward Mr. Procter for his kindness in coming there that afternoon.

The President (Mr. J. O. Powley) now declared that the subject was open for general discussion and expressed the hope that everyone would enter into it.

Mr. W. Kendrick said that the question of lightning stroke interested him, particularly as such different opinions were given by professional men on cases under investigation, which, on the face of it, looked very bad to the layman.

He had acted both for the owners and for the insurance companies in suspected cases and often it was difficult to give a definite opinion. Some were quite obvious cases, others left one in doubt, and some certainly were not cases of lightning stroke. He had encountered cases certified to be due to lightning which proved to be anthrax. In one case after a storm a gelding was found dead under a tree, rather strangely on premises under the foot-and-mouth restrictions, to which the animal had strayed. No marks were found on the horse, which had apparently died without a struggle. Something which appeared to be yew was found in the horse's stomach, but the owner's representative did not consider that there was a sufficient quantity of yew to cause death. The stomach and contents, along with the history of the case, were sent to one of the colleges for an opinion, which was that there was something in the stomach which was not grass, and before saying that it was yew, analysis for toxine, its active principle, was desirable. In the circumstances, however, it was asked, might not the animal have been struck by lightning?

In another case during a storm a tree and building were struck. The water spouts were shattered. Eight pigs were killed outright and five remained without apparent injury. Mr. Kendrick saw these animals within half-an-hour of death and not one showed the least mark. One of the carcasses was forwarded to the Liverpool Veterinary School, and it was reported that, with the exception of rapid decomposition, there was nothing to indicate the cause of death.

In investigating these cases the first thing to find out was if there had been lightning at the time of death. In the Chester area, he believed, insurance companies could get the information from the Royal Air Force at Sealand Aerodrome. The second was to see if one could find definite evidence of lightning effects, and make a careful *post-mortem* examination. It nothing was found on *post-mortem* to account for death, but the circumstances pointed to the probability of death from lightning, one was justified in certifying death probably due to that cause.

Mr. H. S. Caldwell said he had rather an interesting case just lately—eight lambs were alleged to have been killed by lightning. They had been found dead in various parts of the field. He made *post-mortems*, which showed that some had been dead at least a day longer than others; there were slight subcutaneous extravasations in a few, and in all, slight gastritis (abomasitis); anthrax negative. On reaching the pasture another lamb, which had only just died, was found. After investigating the circumstances

he expressed the opinion that the deaths were a result of dipping, which had been done a few days previously.

Mr. N. Brear was very much struck with a remark Mr. Holroyd made, that lightning cases were not common in rocky districts: the most spectacular case he had seen was where five cows were killed on a rocky hillside.

What he would really like to know was what injuries were actually due to lightning. A mare was found, after a severe thunderstorm, with severe injuries to her breast and forelegs. Investigation showed that she had galloped clean through a rubble wall: this was a case of secondary injuries, and thus was not covered by a fire policy. Another case was that of a horse found after a thunderstorm with a broken leg. They had just heard a case quoted from medical literature of a fracture alleged to have been caused by lightning. Could lightning directly produce a fracture of bone without killing the animal? He might be quite wrong, but had always thought this impossible. In this case he reported that the broken leg was a secondary injury probably caused by the animal falling while galloping in fright.

In regard to the granting of certificates, in the most common type of case, where the *post-mortem* findings were indefinite and generally speaking negative, he had been in the habit of relying on the absence of *rigor mortis*. If there was no doubt about the occurrence of lightning, anthrax negative, and there were no other lesions likely to have caused sudden death, and if there was no *rigor mortis*, he thought one was justified in giving a certificate of death from lightning.

Mr. G. O. Davies complimented Mr. Procter on his courage in bringing forward such an original subject. Whilst he himself had but little clinical experience of lightning cases, it had always been a mystery to him why so many deaths due to so-called "lightning" were unaccompanied by any history of a thunderstorm. The term seemed to him to have a very comprehensive meaning and it seemed to include all cases of sudden death which were free from macroscopic lesions in the pleural and peritoneal cavities. To his mind, there were three groups of cases which might be attributed to lightning: first of all there were those cases which were directly due to lightning and showed lesions such as singeing, paralysis and fracture; then there were cases which resulted from cardiac syncope following sudden fright and, thirdly, those which had been mentioned by other speakers where animals took fright and consequently injured themselves. As far as he was aware, there were no characteristic histological changes which enabled one to diagnose death due to lightning.

Mr. E. H. Curbishley desired first of all to compliment Mr. Procter upon the choice of his subject, no less than on the way in which he had dealt with it.

Proceeding, Mr. Curbishley said:—"It is undoubtedly on occasion very difficult to straighten out some of the problems to which these cases give rise. Where there is clear and distinct singeing or the evidence of a reputable witness of the actual death of the animal, the matter is simple enough; but there are many other cases which give rise to wide differences of opinion and a great deal of trouble and careful consideration is necessary before one can agree to the suggestion that an animal may have died from lightning stroke.

"The point with regard to the opinion we appear to have earned in the eyes of the insurance world is very regrettable, but in this connection there is one point I would like to mention, *viz*, practically all insurance companies take fire risks—but all do not specialise in general livestock business, and in those which do not, it is often difficult to find anyone who knows anything at all about animals from the veterinary point of view, and they are apt to form opinions with regard to our reports, etc., which are not fully justified, when we have done our utmost under difficult and trying circumstances to serve them in an honest and straightforward manner. It seems to be not uncommon in offices, who do no livestock business, for a veterinary surgeon to have difficulty in finding anyone who can appreciate the circumstances and conditions under which we often have to work.

"Concerning syncope, I would ask is it due to lightning or otherwise? As Mr. Holroyd said—if the shock is due to a lessened voltage it is very likely that death may be due to heart failure and there is a very interesting little reference to this in Williams' 'Veterinary Medicine,' 1884, which throws some light upon the question. He says:—'There is a particular form of syncope, seen in some forms of poisoning and in lightning stroke, in which death does not take place immediately, but where the animal lives long enough at least to develop definite symptoms of the condition from which it suffers.'

"Another point is of interest—lightning can kill at once any kind of animal, whether healthy or not, and it seems possible that an animal found dead and showing pathogenic lesions at *post-mortem* may still have been destroyed by lightning. That might raise a very interesting discussion from the insurance standpoint—as to possible differences between the estimated nominal and actual value of the animal.

"There is very much more that could be said on this interesting and important subject, but at this late hour time forbids."

The Reply.

In replying to the discussion, Mr. Procter said:—"I thank you for the way you have discussed this matter, but as we have not much time it is a good excuse for my not having much to say. I thank Mr. Holroyd for his criticism and for bringing forward the important forms of lightning—I know nothing about electricity. The discussion has been on lines sufficiently important to warrant the subject being brought forward, and it is evident from what we have heard to-day that there is room for a certain amount of investigation. Mr. Pillers should really have given this paper, if I may say so, and would probably have expressed my views in a more able manner. In view of the present state of our knowledge, we might stretch our imagination in regard to the difficult cases with indefinite lesions, though I am quite prepared to believe, as Mr. Holroyd says, that nine cases out of ten are not lightning. The point is, how is he going to differentiate between these cases? We need further enlightenment—and I, for one, do hope that a scheme may be carried out with a view to giving us some definite guide in making a more accurate diagnosis than is given at the present time."

Sounder Clydesdales.

"The Horse Breeding Act of 1918 has proved a useful statute," says the *North British Agriculturist*. "It has thrown the nondescript stallion off the road, which was a sound step in the right direction. It is true that this class of sire can still 'stand at home,' but it was something to have him prevented from being hawked around at the risk of spreading defectives amongst the horse power of the country. The results of the operation of the Horse Breeding Act in Scotland just issued by the Department of Agriculture are suggestive of the care being taken to ensure, as far as possible, a race of sound horses in the country. What do we find? In 1922 no fewer than 33 out of the 589 Clydesdale stallions examined under the Act were put down. In the following year the number of rejected horses was 20, then the number dropped to 15, with 10, 12, and 13 following in successive years. Last year nine were rejected, and now in 1931, only half-a-dozen out of a total of 372 examined failed to be certified as sound. Of 431 stallions of all breeds examined, only six failed, and all will agree that this was a very good record, showing that ordinary breeders are now in a much safer position than they were some years ago when no control was exercised. These results, let us suggest, lend hopefulness to the improvement which may be looked for in another sphere of live stock breeding by the prospective coming into operation of the 'Scrub Bull' Act."

The Parasitic Origin of Poll Evil and Fistulous Withers.

A. W. Noel Pillers, F.R.C.V.S.

The publication of known facts or those known in other countries is often regarded as overloading the literature. Those who use this phrase seem to imagine that once a fact is established and published in one journal it will have been read, marked, learnt and inwardly digested by all who may be interested in the subject. Many who rub shoulders with realities know that this is not very often the case, and that years may and often do elapse before re-publication brings to light old truths. Advertisement is therefore necessary to bring advances to the notice of the practitioner or to get a brief mention in slowly-changing lecture notes upon which rising generations unfortunately more or less depend. The relationship of nematodes to the above two conditions in the horse is an example of this. Although many hold that the traumatic theory of origin, as usually accepted, has now little to support it, save in a limited number of cases, a recently-issued text book on surgery does not even mention the worm. The following note has been written with a view to interesting operators to have material examined after removal.

There is now a considerable literature upon the subject, dating from 1838 when Ferguson,[1] of London, found worms in tendon sheaths. In 1841 Diesing described *Onchocerca reticulata* from the suspensory ligament and flexor tendons, and for many years the worm in the ligamentum nuchæ was regarded as the same species. Bovett,[2] of Bridgwater, in 1861, recorded nematodes in fistulous withers. Railliet and Henry,[3] in 1910, described the cervical worm as a distinct species and gave it the name of *O. cervicalis.* In 1918 Robson[4] fully recognised the importance of the worm and gave in our own weekly an excellent clinical account of the disease as seen by him in Western Australia. In the same journal, for 1922, W. R. Davis,[5] in a characteristic note described twelve cases of fistulous withers and poll evil on farms almost adjoining one another. This is now a much-quoted report. He mentioned, in addition to his own, the opinion expressed years previously by the late George Upton, that fistulous withers and poll evil were contagious. Hall,[6] in 1923, in America, wrote up most of the then known facts relating to the parasito-clinical aspect of these diseases. There have been many other papers, several of them dealing also with the tendon worm, under the headings of filariasis or spiropterosis of tendons and ligaments. Last year Ackert and O'Neal,[7] in America, examined 11 horses and one mule, and gave a further description of the worm. In two animals no worms or calcified lesions were seen, but worms were present in nine, and calcification in seven. Two of the cases were affected with poll evil, two with fistulous withers, one with both, and the other seven were either surgical exercise cases or *post-mortem* examinations.

Through the good offices of Dr. Ackert, Professor J. L. Graham, of Manhattan, kindly forwarded me some portions of worms, and Dr. O'Neal sent some ligamentum nuchæ with worms *in situ.*

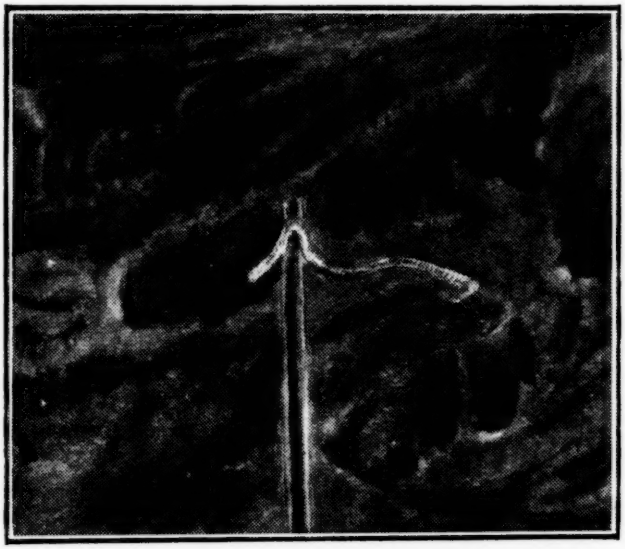

Fig. 1.—*Onchocerca cervicalis* in a portion of ligamentum nuchæ. × 8. It has been partly teased out and its position marked by a pin.

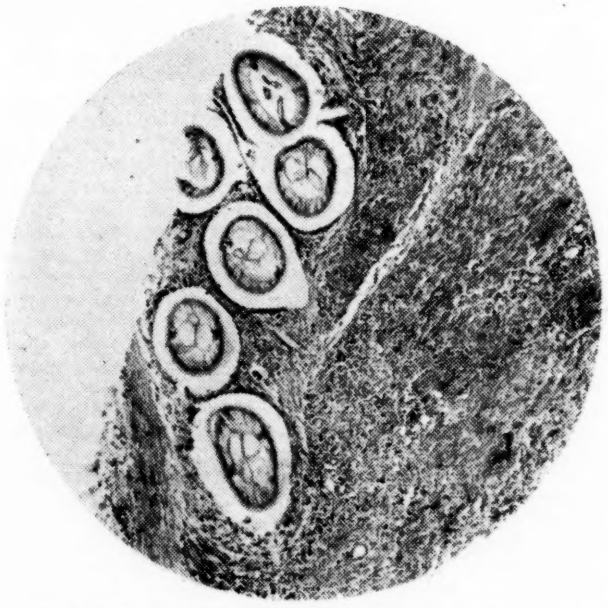

Fig. 2.—*Onchocerca cervicalis.* Transverse sections of a coiled up worm in portion of ligamentum nuchæ removed at operation. × 55.

Although I had often found calcified areas in portions of ligament removed from poll evil cases, I had not detected the actual worm. From the American material it was evident that they were easily missed, especially when the tissue under examination was wet. On March 15th, Mr. P. T. Lindsay, M.R.C.V.S., of Woolton, Liverpool, informed me that he was about to operate on a case of poll evil in which there was no history of injury. He kindly promised to let me have the diseased portion of ligament. This he did on March 22nd. It weighed about 50 grammes and contained three worms. On comparing several portions of one of these with the description, diagrams and material from America, I have no doubt that my specimens are *O. cervicalis,* but I did not obtain complete worms.

The dimensions given by Ackert and O'Neil are as follows :—Male 7·4 to 11·6 cm. long—average 9·5 cm. ; width ·144 to ·161 mm.—average ·152 mm. Female 30 mm. long ; ·144 to ·360 mm. wide—average ·233 mm. One worm was lying amongst a few yellowish-white fibres ; it was invisible to the naked eye, but under a hand lens the striations of the cuticle showed up quite plainly when the specimen was dried. In another place there was slight hyperæmia of the tissue around the worm, and in the other case the parasite was surrounded by somewhat highly coloured material resembling the outline of crumbling cheese.

There are many accounts of bacteriological investigations into poll evil and fistulous withers, but as far as I know there is no experimental proof of actual causation. The lesions of this worm do not, however, resemble those produced by *O. gibsoni* in cattle or *O. volvulus* in man, *viz.*, " nodules " with worms coiled up in fibrous tissue. There seems to be little tissue reaction as is the case with *O. armillata* of the large arterial trunks of cattle and *O. fasciata* of the subcutis of the one-humped camel. It is possible that the worms cause little visible change until they give rise to calcifying nodules up to the size of a walnut, or the tissue around them becomes the seat of bacterial changes with, may be, resultant disease requiring surgical intervention.

Blacklock[8] has worked out the life history of *O. volvulus* of man in Sierra Leone, and has shown that the larval form passes through a bloodsucking black gnat—*Simulium damnosum*. There are several species of this genus commonly encountered in this country.

Stained sections showed no bacteria ; there were a few eosinophiles, many round cells, and polymorphs around the parasite. Nearby were areas of early necrosis.

I am indebted to my colleague, Mr. H. T. Matthews, F.R.C.V.S., etc., for the drawing in fig. 1 and the section in fig. 2 and to Professor S. H. Gaiger for kindly photographing the latter.

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[8]Blacklock, D. P. The Development of *Onchocerca volvulus* in *Simulium damnosum* . *Ann. Trop. Med. and Parasitol.,* Vol. xx (1926), pp. 1-40.

Light-horse Breeding in Cornwall.—Cornwall Agricultural Committee is urging the War Office to reconsider its decision to discontinue the grants for light-horse breeding as a measure of economy. It is pointed out that the county has always been a very satisfactory area for light-horse breeding, and that many farmers who now rely upon it as one of their main sources of income will be badly hit if the scheme is entirely discontinued.

Distemper in the Mink.

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Following on the appearance, in a recent number of the *Veterinary Record,* of an article by T. Dalling entitled " Distemper in the Fitch," it does not seem out of place that a short description of distemper, as seen in the mink, should be given.

Descriptions of this condition have already been published by Rudolf[1] and Wood,[2] and Hinz has recorded in a personal communication to the British workers at Mill Hill his conviction that the disease in the mink is the same as that seen in the ferret. The following observations are intended as a confirmation of these results and also to stimulate the interest of research workers in a field badly needing assistance.

I have seen many epizootics among mink of a disease which in many respects very closely resembles distemper as seen in the ferret, and from clinical observations one would be justified in using this term to describe it. One particular outbreak undoubtedly resulted from the introduction of infected fitch into the mink ranch. The ranch is a model one and the animals are given the best of care and attention. No disease had ever been experienced until the fitch were brought in. Two or three days after the fitch arrived one was noticed to be sick, and by telephone consultation with the owner I suspected distemper by his description of the symptoms. It was decided to advise the destruction of the fitch, and " torch " and disinfect the nest boxes and mink house. This was done, but from eight to ten days later several mink were taken sick and died. A number of these were nursing females with litters of young.

Symptoms.—These were very varied, as is always the case with epidemics among fur-bearing animals. To attempt to classify or draw up a constant or consistent picture of virus diseases among them is practically impossible and to do so would leave grave doubts regarding the experience of the clinician with fur-bearing animals. In some cases there is a distinct swelling around the eyes which may become muco-purulent. In others there is a localisation of pus above the eye but it does not affect the eye proper. The vulva in a number of females becomes swollen and red and the feet have a tendency to swell. This swelling is of an emphysematous nature. The guard and underfur in most cases shed off from the base of the neck to the shoulder. This symptom is characteristic of other diseases of mink and is often found in mal-nutrition cases. With some the appetite is affected but little and they will eat to a few hours before death. Diarrhœa is noticeable. The duration of the disease is very irregular. One animal may appear to be quite normal and suddenly give forth a piercing screech, go into convulsions and die in an hour or two. Others may drag on for as long as five weeks. These cases invariably develop severe chorea and die in convulsions. In some cases an emphysematous swelling is seen around the nostrils and in others there is a profuse purulent discharge from the eyes and nostrils. The incubation period appears to be within ten to 14 days,

but this is difficult to estimate under field conditions. The mortality is high, at least 30 per cent., even where strictest precautions regarding isolation and disinfection are taken. A few mink recover after showing symptoms, but the percentage is very small.

Post-mortem Examinations on fur-bearing animals dying from distemper are very unsatisfactory and the lesions remarkable by their absence Unless the pathologist has a good imagination it is difficult to make up a story at all. The fact that definite lesions are absent can almost be accepted as diagnostic. The carcass may be thin and emaciated or, on the other hand, in a good state of nutrition. The brain in some cases appears to be inflamed and the blood vessels engorged, but sections made from these cases showed no microscopic lesions. Where diarrhœa is present the intestines are inflamed, as would be expected. The liver may be yellow and very friable, but this is a common condition in many ailments of the fox and mink. As a matter of fact, we do not know the normal histology of the mink and to attempt to interpret the extremely scanty pathological lesions in these cases seems fraught with danger.

My colleague, Dr. A. C. Secord, infected four ferrets with a brain and spleen emulsion from the infected mink. These animals died showing all symptoms of true distemper as it affects ferrets.

Treatment.—Removal of all infected and contact animals and thorough disinfection of the premises with "torch" and disinfectants is advised. If, however, the epidemic should take place during the whelping season this is difficult to secure owing to the danger of disturbing the females at this period. The Laidlaw-Dunkin vaccine and serum should be used on all animals showing symptoms of the disease. While we have no data showing the efficiency of the vaccine and serum under controlled experiments, results in the field show sufficient promise to justify their use without delay. Medicinal treatment is quite useless.

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[2]Wood, F. W. *J. of the Amer. Vet. Med. Assoc.* Vol. lxxvii, N.S.30, No. 5, November, 1930, pp. 569-586. "Recent Advances in the Prophylaxis and Treatment of Canine Distemper."

Tuberculosis Risks.

A scheme for the insurance of cattle against tuberculosis risks was formulated some time ago by a Dublin firm of insurance brokers, and submitted to the Dublin Victuallers' Association for approval. The scheme, for the moment, is confined to the cattle slaughtered in the Dublin Corporation Abattoir. The rates of insurance are 2s. per bullock or heifer and 6s. per cow. The amount of compensation payable is three-fourths of the value of the beast, but no beast is insurable the market value of which is less than £6. Assent to the scheme was given by the Association, but definitely on the grounds of its being a temporary expedient, the Association maintaining that the victualler was entitled to State compensation in respect of cattle, condemned in the public health interest, that had been bought in open market subject to inspection by the Public Health Veterinary Authorities. Preliminary sanction to the scheme was given by the Corporation, but final sanction has yet to be given. A conference is to be held shortly to determine matters.—*Meat Trades Journal.*

The Veterinary Record.

December 12th, 1931.

Sir Frederick Smith Memorial Fund.

As will be seen below, the amount subscribed to the Sir Frederick Smith Memorial Fund now amounts to £208 18s. 6d. One can never, of course, measure in terms of money the services any member may render to his profession, but it is clear that this sum does not at all represent the measure of the respect in which the memory of the late General Smith is held by veterinary surgeons. The Fund is still open, and the Committee confidently look to a considerable increase in the number of subscribers before closing it. It is indeed pertinent to point out that, apart from subscriptions received from Veterinary Societies, the contributions received up to date come from no more than 130 individuals! There remain over three thousand members who have still to decide what they will contribute to this fund, which is intended to express the profession's gratitude to a man whose whole life was devoted to its advancement, and whose entire fortune will ultimately be devoted to the promotion of veterinary research.

Sir Frederick Smith Memorial.

Seventh List of Subscribers.

	£	s.	d.
Previous List (October 28th, 1931)	190	1	0
Central Veterinary Society	10	10	0
Yorkshire Veterinary Medical Society	5	5	0
Gunning, Captain O. V.	1	1	0
McCunn, Professor J.	1	1	0
Perryman, W.	0	10	6
Watkins, Major G. F., R.A.V.C.	0	10	0
	£208	18	6

Treatment of Chronic Diarrhœa in Dogs.

An Enquiry.

The Editorial Committee, N.V.M.A., have had submitted to them the following question by a practitioner:—

"I am greatly troubled in practice with the incidence of chronic diarrhœa in dogs. They are brought to my surgery quite often showing no other symptom, and every known method of combating it has in many instances been tried without success. The animals go on with this trouble for weeks and weeks until they become so emaciated and weak that their owners not infrequently feel inclined to have them destroyed. Can your readers kindly give any suggestions, as I should be grateful to learn of any new method?"

The Committee will be glad to receive answers to this enquiry from our readers, with a view to publication.

For the next show of the National Pony Society, to be held at the Royal Agricultural Hall, London, on March 4th and 5th, 48 classes have been scheduled and the prize money amounts to £1,200.

Clinical and Case Reports.

(1) Notes on Irregular Incisor Teeth. (2) A Peculiar Accident.

T. G. Heatley, F.R.C.V.S., Woodbridge, Suffolk.

Not uncommonly I have found, when examining horses on farms, that the corner milk incisors in the upper jaw have not been shed in five-year-olds, and the permanent corner tooth is pushed out of position: this would not be likely to be seen in horses from Ireland or coming from a dealer's stable.

I met with a case last week, in a 10 years old gelding, in which the milk incisors were still in position, and the upper corner permanent teeth were forced sideways out of apposition to the lower corner teeth. They had grown so long that they were impinging on the mucous membrane of the lower jaw and interfering with feeding. The lower corner teeth were also growing up into the gaps formed by the persistent milk teeth. The milk teeth were extracted and the projecting permanent teeth sheared off level.

The interesting point is the length of time it takes for an incisor without any attrition to grow down to the mucous membrane of the lower jaw.

. . . . .

A Peculiar Accident happened this spring. A mare with a January foal was moved out of the foaling box into a covered yard so as to get exercise at about the seventh day. The mare was unshod, and rolled, and in turning right over struck her foal in the mouth with the edge of the upper fore hoof. There was at once profuse hæmorrhage, but when I saw the foal, bleeding had stopped. I laid the foal down and found that what incisor teeth were not knocked out were loose, the premaxilla splintered, and the hard palate separated from the bone for three inches back into the mouth.

I removed the loose teeth, and all splinters of bone, but had to pick up the ends of the palato-labial arteries, as the clot had been disturbed in removing the bone splinters. No dressings were applied and the foal never faltered. In two days, when I saw it, the hard palate was lying well in position on to the overlying bone. The foal was later shown at "The Royal" and got into the money, and was sold at weaning time for £50, so I have lost sight of it, but it would interest me to see the mouth at three years old, as most probably the germs of the permanent teeth were injured or destroyed.

Mr. E. G. Boulanger, Director of the Zoo Aquarium, has pointed out that weight is very important, but not as regards the brain. The brains of most creatures known to science have been weighed and measured, and it seems very probable that mental capacity is not so much a matter of brain weight as of brain area. One respect in which weight is important is in drinking. An insect cannot drink in the ordinary way as the surface tension of the water would prove an insuperable barrier; it has to sip its drink up from a moist surface. Further, if an insect becomes wet it is faced with the difficulty of raising moisture many times its own weight.

REPORTS.

Bovine Tuberculosis in Man.

With Special Reference to Infection by Milk.*

Ministry of Health Memorandum.

(*Continued from page* 1233.)

V.—Methods of Controlling Infection.

Methods of control may be divided into two categories, those designed to check the infection at its source and those applicable to the milk immediately before its distribution.

At the Source.

(*a*) *Eradication by Slaughter.*

In the fight against any disease the ideal aimed at is, of course, complete eradication and the quicker this task can be accomplished the better. Nevertheless, the price of any proposed method for achieving this end is often the governing consideration, and in no case is this more true than in that of bovine tuberculosis. M'Fadyean has said that there is not the least doubt that the disease could be eradicated within a few years, if that were considered necessary, regardless of cost, by enforcing the general tuberculin testing of all the cattle in the country followed by compulsory slaughter of all reacting animals. Such a scheme has, indeed, been carried out with almost complete success in certain places (*e.g.*, Guernsey and certain States of the U.S.A., where high compensation has been paid), but, owing to the high incidence of the bovine disease in this country, its operation would involve the slaughter of from one-third to one-half or even more of all our milking cattle, and of a considerable proportion of the younger stock. This would not only involve the payment of a huge sum of money as compensation for the slaughter of apparently healthy cattle, but it would also immediately reduce very greatly the supply of milk, and increase its price for many years to come. Owing, moreover, to the occasional ambiguities of the tuberculin test and to the presence of the disease in pigs and other animals constituting subsidiary sources of infection, the operation of such a scheme might not prove so successful as M'Fadyean believed. It is indeed practically certain that within a short time reinfection would occur.

In view of the difficulties involved in such radical measures, various modified schemes of eradication have been considered, the outcome of which was the Ministry of Agriculture and Fisheries' Tuberculosis Order of 1925. This order aims at the destruction of every cow suffering from tuberculous emaciation or suffering from a chronic cough and showing definite clinical signs of tuberculosis. The Order schedules three classes of animals, namely:—

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* Reports on Public Health and Medical Subjects, No. 63. Published by His Majesty's Stationery Office, London, 1931. Price 6d. net.

(1) any cow which is, or appears to be, suffering from tuberculosis of the udder, indurated udder or other chronic disease of the udder;
(2) any bovine animal which is, or appears to be, suffering from tuberculous emaciation;
(3) any bovine animal which is suffering from a chronic cough and showing definite clinical signs of tuberculosis;

and makes it compulsory for any person in charge of such animals, or any veterinary surgeon employed to examine such animals, to notify the fact to an Inspector of the Local Authority. The animals so notified are then examined by a veterinary inspector appointed by the Local Authority, and if he considers that they belong to any of the three designated groups they are slaughtered and compensation is paid to the owner at a rate depending upon the condition of the animal. The Order thus aims at the elimination of those animals which are the main source of danger to human beings and to other animals, rather than at the complete eradication of the disease.

This Order has been criticised upon various grounds. First, it is pointed out that the animals in the scheduled categories are often not notified and destroyed until long after they have become infectious, and that consequently most of the harm of which they are capable has been done before they are destroyed. It is true that the Order has only been in operation a short time, and that notifications may tend to be made at an earlier stage in future, but it seems doubtful to what extent this would occur without the introduction of adjuvant measures such as the compulsory routine veterinary inspection of all cattle.

Secondly, the utility of the procedure laid down by the Order is very much limited by the frequent failure to follow up the report on an animal in one of the scheduled categories by a systematic examination of the other animals in the same herd. The necessity for such action has been pointed out by the Ministry of Agriculture and Fisheries (in a circular letter issued in July, 1925) and its frequent neglect is probably due in large part to the extra expense involved.

Thirdly, it is argued that as the farmer is compensated, however late the stage of the disease when reported, there is no strong inducement for him to report early, with the result that a great many cases, particularly of udder tuberculosis, are not notified until they have been infectious for a long time.

These defects would be overcome to some extent by more systematic routine inspection.

(*b*) *Tuberculosis-free Herds.*

A different method of approach to this problem is presented by the policy of building up and maintaining herds free from tuberculosis. This method was first advocated by Professor Bang of Copenhagen, and has been tried with great success in various countries, especially in Denmark. The principle of the method is to separate infected from healthy stock by means of the tuberculin test, and then to rear a healthy herd from the non-reactors, taking care to prevent the introduction of fresh infection. All cows with tuberculosis of the udder or with signs of wasting disease are slaughtered and the reactors and non-reactors are separated, either by keeping the two classes of animals on separate farms or by removing the healthy stock to premises on the same farm as far away from the original sheds as possible. The next step, the rearing of a tubercle-free herd, is effected by removing the calves of tuberculous mothers at birth to clean premises and by strict vigilance preventing the access of infection to these animals. The efficacy of this measure depends upon the fact, demonstrated by Bang, that the calves of tuberculous cows are only very rarely born infected, but as the majority of the exceptions to this rule are born of mothers in an advanced stage of tuberculosis, the calves of such cows should be excluded from the tubercle-free herd. Watch is kept for the first signs of infection in the healthy herd by half-yearly or more frequent tuberculin tests. Bang advocates the building up of the tubercle-free herd entirely from the calves of healthy animals if infection has been present for long in the original herd.

This method is comparatively inexpensive, but requires considerable labour and great vigilance for its successful prosecution, as any mistake or oversight may undo in a short time the work of years. The economical disposal of reactors, to avoid the financial loss consequent upon the sale of infected animals *en masse*, is an essential part of the scheme.

A considerable number of tuberculin-tested herds exist in this country, but the common practice of recruiting them from without renders it almost impossible to keep them free from tuberculosis. The only hope of doing this is by building up the herd from within and keeping it self-contained.

A special investigation of this method is being made in a selected area in Scotland by the Medical Research Council in conjunction with the Hannah Institute for Research in Dairying, Auchincruive, Ayr.

(*c*) *Immunisation with BCG.*

The possibility of controlling bovine tuberculosis by the active immunisation of cattle with live vaccines has been the subject of controversy in recent years.

In 1908 Calmette isolated from a cow a tubercle bacillus which was of the bovine type and was virulent for guinea-pigs, rabbits and cattle, but as the result of prolonged cultivation on a special medium (glycerinated bile-potato) this organism lost its original virulence and became innocuous to guinea-pigs and cattle. A vaccine for oral administration made from cultures of the bacillus and called BCG (Bacille Calmette-Guerin) has been used in a large number of experiments since 1915 for the inoculation of cattle, and since 1921 for infants, as a protection against tuberculous infection. The inventors of this vaccine claim that it is incapable of causing progressive disease and that it confers a considerable degree of protection both on calves and on infants, if given very early in their lives. This claim, however, has been severely criticised as regards both the manner in which the experiments were conducted and the nature of the statistics produced in its support, and a number of competent workers in various countries have failed to find evidence of protection of children by the vaccine, whilst some of them are inclined to attribute fatalities to the operation of this substance, which purports to be completely innocuous.

Whatever may be the truth of the matter it can be stated that Calmette and Guerin have not yet finally established their claim to the satisfaction of the majority of

experienced workers in this field, and that although the recent work of Buxton and Griffith shows that BCG may confer some protection upon calves, the duration of the immunity is unknown, in infants the production of even a temporary immunity is doubtful, and it is not certain that the inoculation of this living vaccine is free from risk.

Attempts have also been made to produce active immunity in cattle by means of dead tubercle vaccines, but the data so far published do not permit of any conclusion as to their efficacy.

(*d*) *Routine Clinical Examination of Cattle.*

Routine clinical examinations of dairy cattle as a means of checking the distribution of tuberculous milk are carried out at present, to a varying extent, in eleven English counties, and it is interesting to note that in at least one of these areas the farmers appreciate the value of the free advice thus given to them, and are beginning to depend upon the inspectors for help in keeping their herds free from tuberculosis. The Milk and Dairies (Scotland) Act, 1914, requires the inspection of cattle from time to time and at least once a year, and in a Circular issued by the Department of Health for Scotland on March 7th, 1930, it was suggested that a minimum of three inspections a year should be aimed at.

It has already been remarked that it is impossible to detect by clinical examination all cases of tuberculous disease of the udder, but it is claimed by the advocates of this method that the great majority of cows secreting tuberculous milk can be so detected if the examinations are carried out in a thorough manner by a competent veterinarian.

In estimating the success of the method due regard has not always been paid to essential differences between the various schemes in operation, Thus, in some cases so-called routine inspection merely consists in the examination of a whole herd consequent upon the discovery in it of an animal in an advanced stage of tuberculous disease, whereas in other cases every herd in the area is systematically inspected at stated intervals.

The information at present available, however, justifies the view that routine inspection, particularly if combined with other measures, can be of great value, not only directly by bringing about a reduction in the number of infective cows, but also by its educative influence and by the control of the non-tuberculous diseases incidentally discovered.

The utility of this method of control, in common with most others, is impaired by the constant changes occurring in the cow population. Animals are frequently sold off because they have become " dry " or unprofitable or for other reasons, and these are replaced, perhaps immediately after an inspection, by other animals from outside sources.

(*e*) *Bacteriological and Biological Testing.*

The examination of samples of milk for tubercle bacilli, whether by the microscopic test or by guinea-pig inoculation, is chiefly of value where the sample is taken near the source.

Such examination, especially when combined with clinical examination by a competent veterinarian, is of considerable importance, and when carried out in an intelligent manner often enables a Medical Officer of Health to discover a cow secreting tuberculous milk and to stop the sale of the latter.

It is impracticable in most cases as a routine measure to examine the milk from each individual cow on a farm on the chance of finding one which is secreting infected milk. Such a procedure is, however, not ordinarily necessary, for if a sample is taken from the mixed milk of several cows and a complete list is made of the cows contributing to the sample, it can then be ascertained whether any such infection is present and should this prove to be the case a more detailed examination can be undertaken to determine its exact source. This method, usually known as " bulk sampling," is, of course, applicable at local milk depôts and the sample may consist of the mixed milk of from 30-50 cows.

It should be noted that direct microscopical examination of bulk samples cannot be relied upon to detect tuberculous infection of the milk, mainly because tubercle bacilli may be missed, but also because there is a slight risk of other acid-fast organisms being mistaken for tubercle bacilli. The procedure is, however, a most useful test for milk obtained directly from a suspected cow, but only positive results are of any significance. A negative result with this test can never be accepted as proof that the milk is free from tubercle bacilli.

Biological examination (by guinea-pig inoculation) is, therefore usually necessary before the individual cow or cows infected can be identified. This test is extremely sensitive; it suffers, however, from several drawbacks, namely, the long time required for its completion (at least four to six weeks), the risk of the guinea-pig dying of intercurrent disease during the test, and the expense incurred. The risk of a test being rendered abortive owing to the premature death of the guinea-pig can be partly overcome by using two animals for the test, but this, of course, increases the expense.

(*f*) *Improved Methods of Cowkeeping and the Education of Cowkeepers.*

Although ordinary sanitary measures have proved insufficient for the control of bovine tuberculosis, yet the value of such measures when used in conjunction with other methods should not be under-rated. The disease in cattle is spread by means of the secretions of infected animals, adult animals being usually infected by others with lung tuberculosis and calves by the consumption of milk from tuberculous mothers. Cows with pulmonary tuberculosis swallow a large proportion of the infectious secretions coughed up from their lungs, so that their fæces may become heavily infected and contaminate pasture, litter and stalls, providing additional channels of infection. Thus, the frequent cleansing and disinfection of cowsheds, especially those parts most liable to be contaminated by mucus from the lungs and fæces, is a matter of great importance. Not only may such materials infect the food and water of other animals but, if they are allowed to dry, the dust of the sheds will become infected and may be inhaled by animals at a distance or even contaminate their food.

Although great improvements in the stalling, care and milking of cows have been effected by milk-producers in recent years, much remains to be done. Old and grossly insanitary cowsheds are still common, and new sheds are

often constructed (or old ones adapted) in a manner displaying ignorance of the principles governing the spread of infection. A common fault is to arrange the stalls in a double row with the cows facing each other, with no adequate partition intervening, thus favouring the spread of infection by coughing.

The education of the cowkeeper in matters of sanitation is still of pressing importance, and is too often lost sight of in an enthusiasm for the more drastic methods of reducing the incidence of the disease.

The question whether the elimination of all sources of infection would result in a loss of immunity among the bovine population which would be followed, upon the reintroduction of the disease sooner or later, by a devastating outbreak must be regarded as being at present of purely academic interest in view of the wide prevalence of bovine tuberculosis in this country. Moreover, it must be remembered that, just as in the case of the human disease, there is no known method of controlling the dosage of infection so as to ensure immunity whilst avoiding serious disease.

(g) *Graded Milk.*

A word must be said here about the part played by the grading of milk in the campaign against bovine tuberculosis.

The Milk and Dairies (Amendment) Act, 1922, and the Milk (Special Designations) Order, 1923, made thereunder, provide for the use of four special designations for milk, namely: "Certified," "Grade A (Tuberculin Tested)," "Grade A" and "Pasteurised," and lay down the conditions to be fulfilled by producers and distributors licensed to sell milk under these designations.

Certified milk and Grade A (Tuberculin Tested) milk are produced by herds which are clinically examined and tuberculin-tested every six months. These milks must not be pasteurised or otherwise treated by heat. Grade A milk is produced by herds which are clinically examined every three months. It must not be treated by heat unless it is pasteurised, and then it must be sold as "Grade A milk, Pasteurised."

At the present time there are in England and Wales approximately 400 herds producing Certified or Grade A (Tuberculin Tested) milk, and 600 herds producing Grade A milk. Even when allowance is made for the fact that these herds (especially those of the higher grades) are usually larger than the average herds of the country, the quantity of milk produced under these designations is only a small fraction of the national supply. The demand is small in most districts. A sufficient supply of each grade is available to meet the requirements of any consumer who wishes to obtain it regularly; and the grading movement has had an important influence in encouraging the tuberculin testing and veterinary examination of cattle in herds whose owners have considered the question of applying for a licence.

Pasteurised milk is not subject to any conditions as to production, but it must be pasteurised, that is to say, retained at a temperature of not less than 145° F., and not more than 150° F. for at least 30 minutes, and then immediately cooled to a temperature not exceeding 55° F. It must not be so heated more than once and must not be otherwise treated by heat.

The number of licensed pasteurising establishments in England and Wales is about 200. It is difficult to say what proportion of the milk consumed in the country is represented by the output of these establishments since they vary very much in size and capacity. The present tendency is for the erection of large establishments, and it is probable that most of the milk now sold in London, and some of the large towns, has been subjected to effective pasteurisation.

2. Before Distribution.

The Operation of the Manchester Clauses and the Milk and Dairies Acts.

It is undeniable that the principal attack upon bovine tuberculosis in common with all other infections, should be directed against its source, but a great deal of the early administrative action had its starting point in the farthest outposts of milk distribution, the large towns, and such action, though admittedly inadequate, was at any rate of great educative value.

In 1899, the Corporation of Manchester obtained a Local Act giving them powers for the control of milk produced outside the City and suspected of being infected with the tubercle bacillus. These Manchester Milk Clauses, which were subsequently incorporated in about 100 Local Acts, constituted an important innovation in health legislation in that they enabled the local authority not only to examine milk inside their own area, but to trace it back to the farm, discover by means of veterinary and bacteriological examinations the infecting animals, and prohibit the sale of milk from these animals in their area.

The objections which were raised to these clauses were firstly that they involved interference by one (or perhaps more than one) urban authority in the district of another authority, and secondly that although the sale of the milk of the cows affected might be prohibited in one or more areas, it was still lawful in other areas, usually including the area in which the milk was produced.

In view of these objections an Act was passed in 1914 repealing the Local Act clauses and replacing them by a national system in which functions were conferred on every County and County Borough Council as regards the cows in their own areas. The provisions of this Act (which were repealed and re-enacted in the Milk and Dairies (Consolidation) Act, 1915) were postponed on account of the War and did not come into operation until 1925. Under Section 3 (in conjunction with the First Schedule) of the Act of 1915, where the Medical Officer of Health of a County or County Borough is of opinion that tuberculosis is caused or is likely to be caused by the consumption of milk from any cows in his area, he reports the matter to his authority, and they, after giving the dairyman an opportunity of being heard, can make an order prohibiting the use of the milk, or any product manufactured from it, for human consumption.

Section 4 of the Act directs that if the Medical Officer of Health of any local authority suspects that milk sold or exposed or kept for sale within the area of the local authority is, or is likely to be, the cause of tuberculosis, he shall endeavour to ascertain the source or sources of supply and, on ascertaining the facts, shall forthwith give notice of them to the Medical Officer of Health of the

County or County Borough in which the cows from which the milk is obtained are kept. On the receipt of the notice the Medical Officer of Health of the County or County Borough must have the cattle inspected and make such other enquiries as are necessary. He may then, if his inquiries justify such a course, proceed as provided by the previous Section with a view to the stopping of the supply of milk.

Due notice of the time of the proposed inspection must be given to the dairyman and to the local authority whose Medical Officer of Health gave the notice, to allow that officer or a veterinary inspector or other independent veterinary surgeon appointed by the local authority or the dairyman to be present.

The final step of stopping the supply of milk is in fact rarely if ever taken, since when the investigations show that a herd contains a cow giving tuberculous milk, steps are taken for her removal and slaughter under the provisions of the Tuberculosis Order.

Section 8 empowers an inspector of the Local Government Board (now the Ministry of Health), the Medical Officer of Health, or any person authorised in writing by either of these officials or by the local authority, to take samples of milk at any time before it is delivered to the consumer, provided that the samples be taken within the area of the local authority in question.

The procedures laid down by this Act are subject to considerable limitations, especially in urban areas. The increasing practice of bulking milk supplies which is carried out by the large companies makes it often impossible to ascertain the particular farm from which any given sample of milk was derived, and in this case all that the Medical Officer of Health can do is to give a list of farms from which the milk may have come. The examination of the cattle on all these farms may impose a severe burden upon the veterinary staff of the County or County Borough Council, as in a case which recently came to the notice of the Ministry of Health, in which 85 farms were under suspicion of supplying tuberculous milk in connection with one sample. Difficulties such as this could be avoided by sampling at the local depôts the milk from herds of a reasonable size before bulking has taken place (see above under Bacteriological and Biological Testing).

Another limitation to the procedure under the Act is the delay consequent upon the long interval which must elapse between collection of the sample and ascertainment of the results of inoculation experiments. During this interval, the composition of the offending herd may have changed considerably, and there may be no record* available of the cows in the herd at the time the milk was taken because nothing was known then of the origin of the infection, and it may be impossible to trace the cows which have been removed.

Again the system of sampling employed under this Act in some urban areas is haphazard; nothing may be known at the time as to the origin of the milk in the churn from which the sample is taken. The milk may be derived from a few or from many cows; it may even be milk from a number of different producers; it may be raw or it may be pasteurised. Even if the churns be all from the same farm, the milk from the only cow with open tuberculosis may be all in one churn.

Many of these limitations do not apply to rural areas, where bulk sampling can be carried out on the farm or at the collecting depôt and the field of enquiry thus reduced.

VI.—Pasteurisation.

Pasteurisation is the method originally suggested by Louis Pasteur for treating milk by heat in such a way as to destroy the pathogenic organisms present without causing those chemical and physical changes in the milk which result from boiling. The Milk (Special Designations) Order, 1923, as already stated, requires that milk sold as "pasteurised" shall have been kept at a temperature of not less than 145° F. and not more than 150° F. for at least half-an-hour, and then immediately cooled to a temperature of not more than 55° F., the milk being heated once only and not otherwise treated by heat.

The process here defined has been shown to give the maximum degree of safety consistent with the preservation of those qualities which give milk its nutritive and commercial value. Milk treated by this process closely resembles raw milk in taste and appearance, and in particular has a good "cream line" (*i.e.*, the amount of visible cream which rises to the surface on standing). It must not be supposed, however, that the same result cannot be obtained by the use of other time and temperature factors, and a whole series of effective time-temperature factors have, indeed, been worked out by various investigators. The important point in regard to the prevention of bovine tuberculosis in human beings is the determination of the thermal death-point of the bovine tubercle bacillus. Very numerous experiments have been carried out to determine this point, and these justify the English standard, though many American investigators are satisfied that a temperature of 142° F. for 30 minutes gives an adequate margin of safety. It should be realised, however, that even the English prescribed process, with a minimum temperature 3° higher than the above, does not afford an absolute guarantee that the milk so treated will contain no living tubercle bacilli, though it may be accepted that any such bacilli will be present in such small numbers as to constitute a very slight risk of infection for the consumer.

Unfortunately the limits of temperature within which the bovine tubercle bacillus is killed, whilst the commercial value of the milk is unimpaired, are extremely narrow. According to Hamill* the taste and flavour and cream line of milk are hardly, if at all, altered by pasteurisation at 145° F. for 30 minutes, but above this temperature the cream line is affected, being decreased sometimes by 40 per cent. at a temperature of 148° F.

It is for this reason that very strict scientific control is necessary for efficient pasteurisation, and that where milk is heated for commercial purposes only and not sold as "pasteurised" the temperature employed is often chosen with special regard to the retention of the cream line, and is too low to provide a reasonable certainty of destroying tubercle bacilli. Although the "flash" system of

* The Ministry of Agriculture and Fisheries' Movement of Animals (Record) Order, 1925, makes it compulsory for all cattle owners to keep complete records of the movement of all animals to and from their premises. This Order is not at present, however, fully enforced.

* Notes on the Pasteurisation of Milk. By J. M. Hamill, O.B.E., M.D., D.SC. Ministry of Health Reports on Public Health and Medical Subjects, No. 17, 1923.

pasteurisation, *viz.*, a very short exposure to a high temperature, is theoretically sufficient to kill the tubercle bacillus, yet it is impossible to ensure that any pasteuriser working on this system will consistently raise the whole of the milk to be treated to the required temperature. The "flash" method has, therefore, been universally condemned by hygienists as unsatisfactory, but it is still employed to some extent because it is comparatively cheap and fulfils the main commercial requirement—the postponement of souring.

Apart from changes in pasteurised milk affecting its commercial value there are other possible changes which might be of considerable importance. With regard to changes in the proteins and salts Hamill, summing up the information available, says: "When milk is pasteurised at 145° F. for 30 minutes no appreciable change takes place in the milk proteins; if, however, the temperature is raised to 150° F. for 30 minutes a small proportion (about 5 per cent.) of the milk albumin is rendered insoluble. Coagulation by rennin occurs slightly more rapidly in pasteurised than in raw milk. The soluble calcium and magnesium phosphates of the milk do not become insoluble or separate out when milk is pasteurised at a temperature of 145° F. for 30 minutes. This treatment has, furthermore, only a slight effect upon the enzymes which are present in milk."* It has recently been ascertained that a small proportion (about 2 per cent.) of the calcium may become indiffusible.

Of at least equal importance is the question of the effect of pasteurisation upon the vitamins in milk. Present knowledge indicates that of these only vitamin C is injuriously affected by pasteurisation.

It will be seen then that pasteurisation carried out in a suitable apparatus and under strict scientific control is capable of protecting the consumer from the danger of infection with the tubercle bacillus, and that milk so treated appears to retain its valuable food properties practically unimpaired.

VII.—Summary as to Present Position.

The main facts with regard to bovine tuberculosis which have been set forth in this memorandum may be summarised as follows:—

(1) The death rates for non-pulmonary forms of tuberculosis in England and Wales, while still high, are decreasing, the rate for 1929 being less than half that for 1911. Loss of life and invalidity from this disease are, however, still matters for grave concern.

(2) It is not possible at present to say what proportion of the cases of tuberculosis in human subjects are of bovine origin, but it seems probable that more than 1,000 children under 15 years die annually in England and Wales from infection of this origin.

(3) It is practically certain that the great majority of human infections with the bovine tubercle bacillus are conveyed by means of cow's milk, and that infection usually occurs during the early years of life, when milk forms a large part of the diet and when susceptibility to infection is greatest.

(4) The proportion of milch cows in this country infected with tuberculosis is not accurately known, but there is reason to believe that it is not less than 40 per cent. Cows are much more often affected than other bovines, and those suffering from tuberculous mastitis are responsible for most of the infection in human beings. The proportion of cows so affected has been variously estimated at 0·3 per cent. to six per cent. These estimates, however, apply to cases of "open" tuberculosis and there are in addition many cows showing no clinical signs of tuberculosis but excreting the bacilli in their milk and fæces. The proportion of cows actually yielding tuberculous milk is probably between one per cent. and two per cent. Whether the incidence of tuberculosis in bovines is increasing or decreasing is not known.

(5) Complete eradication by means of universal tuberculin testing and the slaughter of all reacting animals is not practicable in this country, not only on account of the expense and the dislocation of the milk supply which would be involved in any attempt at such a measure, but also because it is doubtful whether complete and permanent eradication could be effected by this means. A less drastic procedure, but one also involving the slaughter of infected animals, is represented by the Ministry of Agriculture and Fisheries' Tuberculosis Order of 1925. This Order aims at the destruction of cattle in an advanced and more infectious stage of the disease and cannot be expected, without the introduction of adjuvant measures, seriously to affect the incidence of the disease in cattle or man.

(6) The method of building up tuberculosis-free herds has been discussed, and the financial and other difficulties in the way of its success have been pointed out, but it is to be hoped that a more extensive trial will be given to it in this country.

(7) Calmette and Guerin claim to be able to prevent tuberculosis in young calves and babies by protecting them with their vaccine, known as B C G. This claim has not yet been established for babies, but there is evidence that a certain degree of immunity may be produced in young calves.

(8) The next method of control considered is one which has only been tried to a small extent in England and Wales, but has given such encouraging results in Scotland that its area of operation is being rapidly extended. This method is the routine clinical examination of cattle, which, to be fully effective, should involve the thorough and systematic examination by competent veterinary surgeons of all the milk herds at stated intervals, say twice a year, and the exclusion of those found diseased. There is reason to believe that such a procedure, when employed in combination with other methods of prevention, is productive of beneficial results.

(9) The testing of milk by the microscopic and biological methods can be of great value, especially when applied to samples from herds of moderate size (a complete list of the contributing cows being made at the time of sampling) and combined with competent clinical examination of the cattle.

(10) All measures aimed at the reduction of bovine tuberculosis must lose a great part of their effect so long as milch cows are kept under conditions which favour the spread of tuberculous infection. The education of the cowkeeper in the prevention of bovine infection should there-

* Notes on the Pasteurisation of Milk. By J. M. Hamill, O.B.E., M.D., D.SC. Ministry of Health Reports on Public Health and Medical Subjects, No. 17, 1923.

fore occupy a prominent place in any scheme for the eradication of bovine tuberculosis.

(11) Reference has been made to the limited success so far achieved by the scheme for grading milk established by the Milk and Dairies (Amendment) Act, 1922, and the Milk (Special Designations) Order, 1923, made under that Act. The campaign in favour of clean raw milk, must, however, be regarded as of great potential value, and the official grading of milk would constitute an important element in any comprehensive scheme for the improvement of the milk supply.

(12) The Manchester Clauses and the provisions of the Milk and Dairies (Consolidation) Act, 1915, which superseded them, appear to have had but little effect upon the incidence of bovine tuberculosis or the sale of tuberculous milk, though the educational value of these measures has probably been far from negligible. The factors limiting their utility have been pointed out, and a consideration of these demonstrates the paramount importance of those measures which are applicable to the source of the infection or its near neighbourhood.

(13) This conclusion does not justify the neglect of safeguards for the milk consumer which can be applied to the milk after production and before delivery. The problems and procedures of pasteurisation have been reviewed and it has been shown that, subject to careful operation and scientific control, this process ensures a milk which not only is safe for consumption, but also retains its food value practically unimpaired by the heat to which it is subjected.

Report of the Veterinary Director-General of the Department of Agriculture, Canada.*

This comprehensive report occupies some 76 pages and in addition to the report of the Director-General (Dr. George Hilton) contains supplementary reports of Dr. E. A. Cameron, Chief Veterinary Inspector; Dr. E. A. Watson, Chief Pathologist, and Dr. R. Barnes, Chief of the Meat and Canned Foods Division.

An optimistic note pervades the whole report and apparently there is some reason for this. "Dourine of horses and sheep scab have been eradicated, anthrax is practically unknown, while cattle mange, which in the past required the maintenance of numerous swimming vats for the treatment of thousands of affected and contact animals, is now limited to a few small outbreaks amenable to individual hand treatment."

Glanders is only rarely seen, but on the other hand "much difficulty has at times been experienced in the eradication of rabies, due more particularly to the accumulation of stray dogs through the failure of local authorities to enforce suitable laws to control them during our long clean periods."

Redwater in cattle seems to be well in hand in Canada and swamp fever of horses is less prevalent than formerly.

The report states that "the remarkable development of the fur farming industry has resulted in new health and disease problems in the rearing of animals in captivity under artificial conditions for fur production." A highly infective disease resembling, in some respects, canine distemper, has caused severe losses in foxes and an investigation is being carried out with a view to ascertaining the etiology of the condition. Dr. Hilton very rightly adds that "it will be necessary to ascertain what relation, if any, this infection has to canine distemper, as this may have an important bearing upon control measures."

The study of poultry diseases is being actively dealt with and a whole-time pathologist is employed for this purpose.

As in other countries where cattle are bred, contagious abortion causes much economic loss. The accredited herd system for the control of tuberculosis continues and the enrolled herds include some 1,400,000 cattle.

The supplementary reports include that of the Chief Pathologist, Dr. E. A. Watson, who deals exhaustively with the work carried out by the Pathological Division. A considerable amount of work seems to have been conducted into such widely divergent conditions as infectious mastitis of cattle, swamp fever or infectious equine anæmia, diseases of poultry and of fur bearing animals.

The Appendices, seven in number, deal with avian tuberculosis in cattle; repeated intradermal tuberculin tests of cattle with *post-mortem* findings; control and elimination of bovine infectious abortion; swamp fever in the horse; insects affecting wild life in British Columbia; infectious bronchitis of fowls, and the description of a parasite affecting moose and cattle in Nova Scotia.

It is, of course, impossible to give more than a very brief outline of this very interesting report, but it is hoped that sufficient has been said to indicate its value to those interested.

G. W. D.

* Report of the Veterinary Director-General of the Department of Agriculture, Canada, for the year ending March 31st, 1931.

Motor Car Brakes and Floods.

The Automobile Association reminds motorists that brakes may be temporarily ineffective after passing through floods. Metal to metal brakes generally are less affected than those with fabric linings.

After passing through a flooded area, the A.A. points out, brakes should always be tested immediately for efficiency, and in the event of their not working satisfactorily, the car should be run for a short time with all brakes lightly applied.

Any trouble from the exhaust pipe being submerged, can be obviated by keeping up the engine speed, and using a low gear.

A Cow's 36 Tons of Milk.—Hadham Goldstream 11th, a pedigree Guernsey cow owned and bred by Messrs. C. Norman, Much Hadham, has a capital record both at the pail and in the show ring. Aged 12 years, she has produced nine calves, giving an average of over 1,000 gallons of milk with each calf. In her last lactation she gave 1,641 gallons, with an average of 5·29 per cent. butter fat. Since she has been in the herd she has yielded the remarkable total of 36 tons 3 cwt. of milk, with an equivalent of just on two tons of butter fat. Her show successes include first in the milking trials at the Royal Show, 1925; first in Milking Trials, first Butter Tests, Stagenhoe Cup, and National milking challenge cup (against all breeds), London Dairy Show, 1929; and first Milking Trials, London Dairy Show, 1930.

Abstracts.

[**Contribution to the Study of Enteritis in Lambs.** Carré, H., *Recueil de Méd. Vét. de l'Ecole d'Alfort*, cvii, 6, pp. 321-335.]

Lambs affected varied in age from two days to six weeks. Primary symptoms occurred in the bowel, as evidenced by diarrhœa or by hard fæces covered by tenacious mucus. Locomotor troubles supervened and many lambs were affected with paralysis (so-called meningo-encephalitis). Albuminuria was present and lung symptoms preceded death in the more chronic cases. *Post-mortem* examination showed presence of blood in bowel content and inflamed mucous membrane of the large bowel. In older lambs, oöcysts of coccidia and cysts of *Entamœba ovis* were found, while in many early cases no parasites were demonstrable. The mesenteric ganglion was generally enlarged and the liver and kidneys showed pathological changes. Pneumonia was also present in many cases. Cultures made from heart blood and musculature always proved sterile.

Efforts to reproduce the condition in lambs by feeding fæces from an affected lamb were inconclusive.

The author believes that parasites play a doubtful rôle in the condition as (1) the lesions are identical whether parasites are present or absent; (2) the lesions are similar whatever species of parasite is present and (3) parasites are not present in lambs that die suddenly at the beginning of an outbreak, but only occur in lambs showing a certain amount of resistance and having irritated mucosa. He concludes that the cases he investigated were not essentially parasitic in origin but were due more often to deficient nourishment. Prophylactic measures are suggested. These are:—

(1) The improvement of food given to the ewes during gestation and lactation so that the milk should be as rich as possible;

(2) The prolongation of suckling to the age of four months and careful weaning between the fourth and fifth months;

(3) Easily digested food to be given to weaned lambs, and

(4) Boiled and sweetened cow's milk to be given where ewe's milk fails.

J. K. B.

[**Diagnosis of Contagious Abortion by the Agglutination and Complement Fixation Tests on Milk Serum.** *D.T.W.* No. 36. September 5th, 1931. 562.]

The author refers to the presence of specific antibodies, such as agglutinins and complement fixation amboceptors, in the milk serum of cows infected with *Br. abortus*. Is it possible that milk might serve as a satisfactory fluid for the detection of affected cows? In consequence of certain regulations which prohibit the sale in Germany of milk from *Br. abortus* infected and expelling cows, it is desirable to explore further the possibilities of this simple milk test. A summary of previous work on this subject is given, and the verdict of Poppe quoted, which states that for the serological diagnosis of *Br. abortus* infection in cows milk is inferior in value to blood.

The most suitable and the simplest way to obtain milk serum is to coagulate with rennet, preferably after the removal of fat. Imperfectly clear milk serum and sour milk exercise an inhibiting effect on complement deviation, and cloudiness likewise obscures the reading of the agglutination test. Milk for testing may be preserved by the addition of a small amount of formalin or boric acid. The results of milk serum agglutinations do not correspond accurately with those of the blood, but agreement was noted in tests on healthy cows and in those with a high *Br. abortus* titre. In the latter it was observed that the level of agglutins in the milk serum was roughly 10 per cent. of the blood. Cases occurred where agglutination was detected in the blood while the milk was negative, and in others the milk alone was positive. This shows that in the detection of *Br. abortus* spreaders it may be desirable to carry out both tests.

The author considers an agglutination of milk serum in 1 : 10 positive, and 1 : 5 as doubtful. The highest milk titre observed was 1 : 500, but as a rule the extent of agglutination lies between 1 : 20 and 1 : 80. Cows whose milk serum completely or almost completely fixes the complement in ·3 c.c. amounts, must be regarded as infected. This test, however, is of less practical importance since it is impaired by cloudy or acid milks, and does not yield such accurate results.

W. L. S.

Review.

[**Veterinary Obstetrics.** Williams, W. L., v.s., Ithaca, N.Y. Second Edition. pp. xvii + 482, with 4 coloured plates and 101 illustrations in the text. Published by the author. Price 30s.]

The first edition of this work was published in 1917 with 630 pages and 140 illustrations in the text, and the author strikes an important note in his preface by pointing out that so many new facts have come to light as to necessitate complete re-writing of almost the entire volume. He also points out that while the conclusions will naturally not be universally endorsed, yet a radical departure from the former traditional views and teachings is justified. Hence it is our opinion that a detailed criticism of the subject matter of this volume is neither necessary nor desirable. It is written in such a readable style and all the views and arguments of the author are so clearly based on a wealth of experience and careful observation that we at once recommend every student of veterinary obstetrics—post-graduate or undergraduate—to peruse it carefully. It cannot fail to make him think and take a wider and more intelligent view of his obstetrical problems.

The introductory chapters deal with obstetrical anatomy and physiology with pregnancy and embryology. These are followed by chapters on the hygiene of the pregnant animal, physiological birth, accidents of pregnancy and dystocia. Abortion, which received considerable attention in the earlier edition, is passed over. Injuries during and untoward sequelæ to parturition are discussed—the causation of milk fever is dealt with most impartially with reference to recent work on the condition, but without giving any indication of the author's own views, which would have been welcome.

The concluding chapter on the puerperal female and the new-born young is most interesting and likely to be provocative of discussion. The author recommends routine examination of the uterine cavity of cows after calving in all cases and this is supported by a considerable experience of the procedure. The technique is carefully detailed and we are assured that if properly carried out no harm but very much benefit will ensue. Perhaps more startling, owing to its simplicity, is the procedure for the prevention of the calf scours largely due to indigestion. The calf is allowed with its dam for 12 hours and then parted for 12 hours, after which the first feed consists of one pound of whole milk, one pound of limewater and four ounces of castor oil—a mixture which the calf is stated to take willingly. The calf is fed twice daily, the amount of milk and limewater remaining constantly at one pound each for several days, after which the milk is gradually increased. Further details are given as to procedure in varying circumstances.

We have found the book most interesting and instructive and feel certain that all practitioners engaged in obstetrical work will be fully repaid by pondering over the problems so lucidly dealt with.

A good index and complete bibliography are appended.

Examination of Irish Cattle at Ports.

The question of the increase in veterinary surgeons' fees for the examination of Irish cattle at ports in Great Britain was discussed at a recent meeting of the Irish Livestock and Cattle Exporters' Association.

A letter was read from the Ministry of Agriculture and Fisheries in London stating that the Minister was unable to adopt the proposals of the Exporters' Committee to reduce the fee. "The position will be closely watched," the letter stated, "and the fees will be reduced as soon as possible."

Mr. Birmingham said that he did not see why there should be any increase in prices at all, and the Chairman suggested that they should wait until the end of the year, and then see what could be done.

Heavy Fine for Failing to Report Tuberculous Cattle.

At Lewes Petty Sessions on November 27th, Tom Rowland, of the Rise Farm, Southover, Lewes, was summoned for having on October 24th, at Lewes, contravened the provisions of the Tuberculosis Order, 1925, in that he being a person in possession of five cows which appeared to be suffering from tuberculous emaciation, delayed giving information to the proper authorities.

After hearing evidence, the Chairman said the Magistrates had no hesitation in saying that defendant neglected his duty in failing to report the animals to the police. They regarded this as a very serious case indeed because of the risk, not only to other cattle on the farm, but to cattle on his neighbours' farms. The case was aggravated because it was not in respect of an isolated animal but in regard to several animals, and also that defendant was a man of great experience with cattle and he ought to have been the first man to report anything in the nature of a suspicious case. They imposed a fine of £35 and also ordered defendant to pay £15 costs.

Defendant said he could not pay, and he was informed that the alternative to distress would be three months' imprisonment.

The Chairman said defendant would be allowed a fortnight in which to pay.

N.V.M.A. Divisional Reports.

Yorkshire Division.*

Officers Elected at Leeds.

The Autumn General Meeting of this Division was held at the Hotel Metropole, Leeds, on Friday, November 6th, 1931. The retiring President, Mr. G. E. Bowman, occupied the chair at the outset and 20 members were present.

The minutes of the last two meetings were confirmed, and the Hon. Secretary intimated the receipt of apologies for absence from Messrs. Abson, Bolton, D. Hamilton and Croudace.

Correspondence.—(1) From Mr. F. B. Greer, tendering his resignation as a member of the Division. It was moved by Mr. Clarkson and seconded by Mr. Crawford that the Secretary write and ask Mr. Greer to reconsider the matter.

(2) From the General Secretary, N.V.M.A., together with the resolution of the Midland Division *re* Johne's disease. It was decided, on the proposition of Mr. D. S. Rabagliati, seconded by Lieut.-Colonel Bowes that, owing to the importance of the subject and the limited time at disposal that day, this matter be referred to a future meeting. Mr. J. W. Procter suggested that a representative of the Ministry be asked to attend the meeting at which the subject will be discussed.

(3) From the General Secretary, N.V.M.A., together with the article "The Veterinary Profession and its Obligations to the Public," asking members of the Division to use all possible influence to obtain publication of the article in local newspapers. Later in the proceedings this matter was stressed by Mr. J. R. Rider, who was present and nine members undertook to approach various papers and endeavour to get publicity for the article.

Obituary.—Mr. J. W. Procter now said he had a sad duty to perform, namely, to record the great loss which the Division had sustained since the last meeting in the death of Mr. John Gaunt. It was resolved to send a message of condolence to the widow and relatives, and members stood in silent tribute.

Nomination.—The Secretary nominated Mr. Stone, of Malton, as a member of the Division.

Sir F. Smith Memorial Fund.—It was explained that, although at the last general meeting a donation of £5 5s. had been voted to the Sir F. Smith Memorial Fund, according to the rules of the Division it had been necessary to publish the matter on the Agenda. It was formally moved by Mr. Clarkson, seconded by Mr. Rabagliati and carried, that the donation be made.

Finance.—The Hon. Treasurer, Mr. McCarmick, presented his annual balance sheet, which was adopted on the proposition of Mr. Scott, seconded by Lieut.-Colonel Bowes.

Election of Office-bearers.

President.—From the chair, Mr. Bowman proposed as h's successor Major J. A. Dixon. The proposition was seconded by Mr. Crawford and carried unanimously.

A vote of thanks to Mr. Bowman for his services as

* Received for publication November 19th.

President in what had been a very successful year, was accorded on the proposition of Mr. D. S. Rabagliati, seconded by Mr. W. R. McKinna. Mr. Bowman returned thanks, as did Major Dixon on his election to the chair, which he then proceeded to occupy.

Hon. Treasurer.—The President said that he much regretted to announce that Mr. McCarmick had decided to ask the members to relieve him of the responsibility of this office. He had given many years of service as treasurer and during that time he had brought the finances of the Division to a very healthy condition. Mr. McCarmick proposed as his successor Mr. F. C. Scott. This was seconded by Mr. W. R. McKinna and carried. Mr. Clarkson proposed and Mr. Crawford seconded that a special vote of thanks be given to Mr. McCarmick for his long and invaluable service to the Division. This tribute was paid with acclamation.

The other officers were elected as follows:—

Secretary.—Mr. S. Sharp.

Vice-Presidents.—Mr. G. E. Bowman, Mr. H. M. Holland and Mr. W. Halstead.

Auditors.—Mr. William Crawford and Mr. G. C. Barber.

Council.—Messrs. H. G. Bowes, W. A. Campbell, W. R. McKinna, E. F. McCleery, A. McCarmick, J. W. Procter, G. Whitehead, S. B. Vine (Mr. J. Clarkson and Mr. D. S. Rabagliati *ex-officio*).

Representatives of Council N.V.M.A.—Messrs. H. G. Bowes, J. Clarkson and D. S. Rabagliati. Although Mr. McCarmick has relinquished the post of Treasurer it was decided that he, with Mr. Clarkson, should continue to act as trustees for the financial stock of the Division.

Sick Animals of Poor People.—Mr. J. R. Rider was present to enlarge on the memorandum of the Organising Committee of the National Association on the schemes for treatment of sick animals of poor people. To consider this matter the meeting went into committee.

At the conclusion of the discussion, Mr. D. S. Rabagliati proposed and Lieut.-Colonel Bowes seconded that a committee be formed to consider what action might be taken and to report its advices to a future meeting. The committee was formed as follows: The President, Messrs. Holland, Procter, W. R. McKinna, McCarmick, Crawford, Watson, Scott, Halstead, Halliday and Campbell, with power to co-opt if necessary.

Mr. Rider was thanked for his presence and the great benefit of his address and advice.

Before the conclusion of the business Mr. W. R. McKinna mentioned the continued illness of Mr. W. Ackroyd, of Halifax, and the Secretary was instructed to write a letter of sympathy with an expression of hope for a speedy recovery.

At the conclusion (as customary at the autumn meeting) the country members were the guests of the Leeds members at tea.

S. Sharp, *Hon. Secretary.*

The results of an investigation as to how and when children are infected with tuberculosis which was carried out in Trondhjem, Norway, where there is a well-organised public health service, tend to prove that many children acquire their tuberculous infections outside the home and outside the house in which they live.

Lancashire Division.*

Meeting at Manchester.

A meeting of the above Division was held at the Grand Hotel, Aytoun Street, Manchester, at 2.30 p.m. on Friday, October 23rd, 1931. The President, Mr. J. O. Powley, occupied the chair, and others present were:—Messrs. A. L. Mullen, H. T. Matthews, J. H. Lomas, A. H. Leyland, N. Brear, G. O. Davies, J. H. White, R. C. Locke, J. W. Brittlebank, H. S. Caldwell, E. H. Curbishley, J. Holroyd, W. Woods, A. W. N. Pillers, H. D. Heggarty, H. Davies, W. Kendrick, O. A. Ducksbury, J. W. Procter, F. Hopkin, W. Fowle, R. H. Oddy, J. Spruell and E. W. Prescott. *Visitors*:—Messrs. J. R. Rider, G. C. Webster and A. L. Bragg.

Letters of apology for unavoidable absence were received from:—Messrs. S. Wharam, J. Urmson, G. Mayall, H. Burrow, J. H. Wright, S. H. Gaiger, H. H. Aldred, T. Eaton Jones, P. T. Lindsay, C. Hargreaves, F. G. Edwards, R. Hughes, G. H. Locke, A. B. Mattinson, J. W. Marslands and J. K. Calderwood.

The minutes of the last two general meetings were confirmed and signed.

Correspondence.—The resignation of Mr. G. V. Slinn was accepted with regret.

It was unanimously agreed that letters of condolence should be sent to Captain Parker, who is ill, and to Mr. J. J. Garside, who has met with an accident.

Nominations for Membership.—Messrs. R. S. White, M.R.C.V.S., and D. C. Webster, M.R.C.V.S., were nominated for membership.

Election of New Members.—Messrs. R. M. Lee, M.R.C.V.S B.V.SC. (Toronto), Crewe, and A. L. Bragg, M.R.C.V.S., Tarporley, were elected members of the Division.

Election of Honorary Councillors.—It was proposed by Mr. Curbishley, seconded by Mr. Brear and carried, that the following members be elected Hon. Councillors:—Messrs. J. Holroyd, F. Hopkin, G. H. Locke, A. W. N. Pillers and W. Woods.

Schemes for the free treatment of sick animals of the poor.—The President reported that a letter had been received from the National Veterinary Medical Association in reference to the above schemes, together with a memorandum drawn up by the Organising Committee. Mr. J. R. Rider had kindly come to open the discussion on the subject, and in order to allow the discussion to be as free as possible, he proposed that the meeting go into committee. On reverting to open meeting, Mr. Pillers proposed, Mr. Curbishley seconded, and it was carried that the following committee be elected to consider the schemes:—The President, Messrs. J. W. Brittlebank, F. Hopkin, J. Holroyd, J. H. White, W. Fowle, H. G. Rogers, H. Sumner, Junr, and the Hon. Secretary.

The President proposed that a vote of thanks be given to Mr. Rider for coming and addressing the meeting. This was seconded by Mr. Matthews and carried.

Paper.—The President invited Mr. J. W. Procter to read his paper on "Procedure in Suspected Lightning Cases."

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* Received for publication November 16th.

[Mr. Procter's paper, and a report of the discussion which followed its presentation, are reproduced earlier in this issue.—Ed.]

A vote of thanks to Mr. Procter for his paper was proposed by Mr. Pillers, who said that, if pursued to its logical conclusion, it would create a new era for the activities of the Division. The whole force of his remarks would be lost, however, unless some *pro forma* scheme of how to start to diagnose lightning stroke were drawn up and circulated, especially for those known to have a weakness for lightning—(laughter)—a scheme of the manner in which these cases should be approached. If that could be done some guidance would be given and practitioners would be able to look over it and, if it were important enough, they could send it on to the National Veterinary Medical Association.

Mr. Caldwell seconded, and the vote of thanks was carried with applause.

Mr. Brear proposed, Mr. Caldwell seconded, and it was carried that a small committee consisting of Messrs. Pillers, Procter and the President draw up a "Scheme of Procedure in Suspected Lightning Cases."

Any other business.—The President observed that, with reference to the next meeting, Mr. Davies was to have given a paper on June 17th on "Actinomycosis," but owing to the poor attendance at Liverpool, the paper was not given and in justice to Mr. Davies they must ask him to honour them with the paper in December. Actinomycosis interested the practitioner, and especially the practitioner who was too busy to read. Mr. Davies would give them a thoroughly interesting and instructive lecture. The suggested date was December 2nd.

The Secretary read a letter from the Secretary of the National Veterinary Medical Association, accompanying a resolution from the Midland Counties Division, in reference to the advisability of Johne's disease being made notifiable. It was proposed by Mr. Holroyd, seconded by Mr. Caldwell and carried, that this matter be left to the Council to consider.

J. Spruell, *Hon. Secretary.*

Derbyshire Division.*

Meetings at Derby.

A special meeting of veterinary surgeons, convened by the Division, but open to all veterinary surgeons practising within its area, was held at the County Council Agricultural Institute, St. Mary's Gate, Derby, on Tuesday, October 20th, at 2 o'clock.

Captain O. V. Gunning was elected to the chair.

Captain J. R. Rider, Darlington, attended the meeting and opened the discussion.

All present were members of the Derbyshire Division, but letters of apology for absence were received from other veterinary surgeons in the area.

The proceedings were held in committee.

At the conclusion, Captain Rider was heartily thanked for the trouble he had taken in attending, and for the full information he placed before the meeting.

* Received for publication November 17th.

Officers Elected at Quarterly Meeting.

The quarterly meeting of this Division was held at the County Council Agricultural Institute, Derby, on Tuesday, October 20th, 1931. The President, Captain O. V. Gunning, occupied the chair, and there were also present Messrs. Abson, Auchterlonie, Bagshaw, Cockburn, Deville, Evershed, G. Howe, Levie, Morris, Stewart, Torrance, Wilkinson and the Hon. Secretary. Apologies for absence were received from Messrs. T. Ludlow and Geo. Eaton.

The minutes of the last meeting, as printed in the *Veterinary Record,* were approved and signed.

Nominations.—Mr. L. B. A. Grace was nominated for membership by Mr. Levie.

Election of new members.—Mr. J. R. Stewart and Mr. R. G. J. Lake were elected as members.

Correspondence.—(1) From the Secretary R.C.V.S. *re* the Sir Frederick Smith Memorial Fund. It was agreed to subscribe £3 3s. to the fund.

(2) From the Secretary N.V.M.A., enclosing and supporting a letter from the R.C.V.S. in which strong disapproval was expressed of the practice of members of the profession using letters on their notepaper and otherwise which do not represent any special qualification.

(3) From the Secretary N.V.M.A., enclosing copies of an article for the Press. Copies of this article were taken by certain of the members present.

(4) From the Secretary N.V.M.A., enclosing a resolution brought forward by the Midland Counties Division regarding the advisability of Johne's disease being made notifiable.

After some discussion, it was agreed that such a course was advisable.

Programme for next meeting.—It was agreed that Captain T. M. Doyle be asked to give a talk on Poultry Diseases.

Election of Office-bearers for 1932.

President.—H. W. Steele Bodger.

Past President.—Captain O. V. Gunning.

Vice-Presidents.—H. S. Cockburn and P. Abson.

Secretary and Treasurer.—W. J. Ironside.

Auditors.—Messrs. Evershed and Auchterlonie.

Council.—Messrs. Cockburn, Deville, Furness, Levie, Torrance and Wilkinson.

Other business.—Arising out of the Special Veterinary Meeting held prior to the Divisional Meeting it was resolved:—

"That this Division take steps to approach local branches of the R.S.P.C.A. with the object of formulating a satisfactory scheme for the treatment of poor persons' animals."

A committee was appointed to consider matters referring to this resolution and the following members were elected to the committee:—Messrs. Abson, Auchterlonie, Evershed, Gunning, Torrance and Ironside.

A vote of thanks was accorded Mr. Bond for the use of the room, and this concluded the meeting.

Wm. J. Ironside, *Hon. Secretary.*

West Perthshire flockmasters are suffering from sheep being killed by motor vehicles on unfenced roads in moorland districts. They consider that road authorities should be compelled to fence roads in places where damage is prevalent.

In Parliament.

The following questions and answers have been recorded in the House of Commons recently :—

Foot-and-Mouth Disease.

Mr. Hurd asked the Minister of Agriculture if his Department has discovered any indications of the source of origin of last summer's outbreak of foot-and-mouth disease in county Armagh?

Sir J. Gilmour : My Department has no jurisdiction in Northern Ireland as regards animal diseases, but I am informed that the Ministry of Agriculture, Northern Ireland, after exhaustive investigation, reached the conclusion that the only apparent source of infection on the farm in County Down on which the disease first appeared was cauliflowers from the Continent.

Mr. Hurd asked the Minister of Agriculture what progress the Foot-and-mouth Disease Research Committee has made with its further tests under trade conditions of foreign dried milk and other milk products to ascertain whether they are carriers of foot-and-mouth disease; and when a report may be expected?

Sir J. Gilmour : I have communicated with my hon. Friend on this matter. The practicability of securing tests under trade conditions is being explored, and I will inform my hon. Friend of the results as soon as they are available.

Sir C. Cayzer asked the Minister of Agriculture whether his attention has been called to the recent report of the Foot-and-mouth Disease Research Committee as to the possibility of the disease being carried into this country in imports of dried milk and to the experiments of the committee definitely proving that dried foreign milk contaminated with foot-and-mouth virus can remain infective for a month; and what action he proposes to take to meet this danger?

Sir J. Gilmour : I am not in a position at present to add to the reply which I gave on November 16th last to a similar question by my hon. Friend the Member for Devizes (Mr. Hurd).

On a subsequent occasion, Mr. Hurd asked the Minister of Agriculture what administrative action he proposes to take following upon the conclusion of the Government of Northern Ireland, after thorough expert investigation, that last summer's serious outbreak of foot-and-mouth disease in this country had its origin in vegetables imported from disease-ridden countries of the Continent?

Sir J. Gilmour : The only effective action possible would appear to lie in the direction of the prohibition of imports. How far such action is justified and practicable must be determined in the light of all the circumstances. The information at the disposal of my Department would not at present justify such action in the case of Continental vegetables, but I can assure my hon. Friend that the position will continue to be carefully watched.

Mr. Hurd : Does that reply mean that these vegetables, which may carry the virus of the disease, are still to come in here?

Sir J. Gilmour : All that I can say is that in the numerous cases of foot-and-mouth disease, while some of them have been attributed to such origin, that has not been the fact in the general case.

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Vaccine Cultures (Experiments).

Sir Frank Sanderson asked the Minister of Agriculture whether he will take steps to see that the Calmette, or B C G vaccine, concerning the bad effects of which upon experimental animals certain experts have given evidence at the inquiry into the death of 76 babies at Lübeck, shall not be used upon farm animals in this country without his consent?

Sir J. Gilmour : I am informed that vaccine cultures have been distributed by Professor Calmette to responsible medical and veterinary authorities for experiment and trial. In this country three veterinary laboratories are supplying vaccine to veterinary surgeons for the treatment of calves born in certain selected infected herds, but no case has been brought to my notice in which the vaccine is alleged to have produced harmful effects. I understand that the vaccine is not being sold by commercial firms and is not obtainable by the public. I do not propose to restrict the work of the laboratories engaged on farm trials of the vaccine.

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Imported Milk Regulations.

Brigadier-General Clifton Brown asked the Minister of Health whether he is aware of the importation last week of milk churns containing foreign imported liquid milk; and what are the medical regulations under which this milk is allowed into this country?

Sir H. Young : Yes, Sir. The regulations in question are the Public Health (Imported Milk) Regulations, and these provide for registration of consignees by the Port Sanitary Authority, and require that imported milk shall not contain more than 100,000 bacteria per cubic centimetre, and shall be free from tubercle bacilli. I may add that samples of the milk referred to by my hon. and gallant Friend are being taken under the regulations.

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Slaughter of Animals (Model By-laws).

Lieut.-Colonel Moore asked the Minister of Health the number of local authorities which have adopted the Ministry's model by-laws 9*a* and 9*b*, respectively, in regard to the slaughter of animals.

The Minister of Health (Sir Hilton Young) : The numbers are : model by-law 9(*a*), 145; and model by-law 9(*b*), 416.

Lieut.-Colonel Moore : Has my right hon. Friend any information as to how the model by-laws are actually working in the various parts of the country?

Sir H. Young : I have no information to the effect that they are working ill. Perhaps my hon. and gallant Friend will put down a question.

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Horses (Purchase).

Captain P. Macdonald asked the Financial Secretary to the War Office the number of horses purchased by the military authorities for each of the past five years from Great Britain, the Irish Free State, and foreign countries; and whether in future he will arrange for such purchases to be made solely from Great Britain?

Mr. Cooper : The figures asked for in the first part of the question are given below. As regards the second part, it is the policy to purchase horses in Great Britain whenever possible, but at present the supply is not sufficient to meet requirements, and a proportion of the horses are obtained from the Irish Free State. Horses are only purchased from foreign countries for troops stationed in or near those countries.

The figures are as follow :—

	Great Britain.	Irish Free State.	Foreign Countries.
1927	487	155	16
1928	431	403	127
1929	741	429	13
1930	660	424	6
1931 ... ... (to 30th November).	724	299	1

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Ponies (Imports).

Mr. Patrick asked the President of the Board of Trade whether he can give the numbers of ponies imported during the past year from Iceland, Russia, and elsewhere into this country for use in mines?

Mr. Hore-Belisha : Separate particulars of the imports into the United Kingdom of ponies for use in mines are not available, as they are recorded under the general heading of "Horses (including ponies)." I will, however, circulate in the Official Report a table showing the imports of horses (including ponies) into the United Kingdom during the 12 months ended October 31st, distinguishing

the countries specified. Full particulars as to the countries from which horses were imported in 1930 and the four preceding years will be found on pages 329 and 330 of Volume 11 of the Annual Statement of Trade, 1930.

Following is the table :—

Statement showing the number and declared value of horses (including ponies) imported into the United Kingdom during the 12 months ended October 31st, 1931, distinguishing the imports consigned from Iceland and the Soviet Union.

	Stallions.		Mares.		Geldings.	
	Quantity.	Declared Value.	Quantity.	Declared Value.	Quantity.	Declared Value.
	No.	£	No.	£	No.	£
Total Imports...	478	300,236	3,831	1,367,283	7,243	606,934
Of which consigned from:—						
Iceland ...	50	350	—	—	185	2,210
Soviet Union...	—	—	23	230	128	1,450

Suggested Origin of Ulster Foot-and-mouth Outbreak.

The Belfast correspondent of the *Daily Express*, in a communication published in that paper on November 26th, states :—

"Ulster Ministry of Agriculture experts claim to have discovered the origin of a foot-and-mouth disease outbreak which occurred in Co. Down. Dutch cauliflowers are said to have been the carriers of the disease into Ulster. The outbreak cost Ulster cattle dealers thousands of pounds, and many cattle were slaughtered here and in England.

"The cauliflowers, it is pointed out in the Ministry's report which was issued to-day, arrived on a farm near Downpatrick towards the end of May, and the outside leaves were thrown on a refuse heap and were accessible to animals.

"The report continues: 'It is an accepted fact that greenstuff of this nature can convey the virus of foot-and-mouth disease, and it is of the greatest significance that during the month of May, 1931, more than 700 outbreaks of foot-and-mouth disease were confirmed in Holland, where the farming system employed frequently brings animals into close contact with vegetable products.

"'Two main facts, therefore, emerge in connection with the Ulster outbreak :—

"'(1) Every case of disease could be traced to one farm in Northern Ireland.

"'(2) The only apparent cause of infection on that farm was continental vegetables.

"'The disease was found to exist on 12 other farms in the Downpatrick vicinity. In every case the original infection was definitely traceable to the original farm. Investigations showed that there was no disease on the premises from which two Irish Free State animals originated.

"'These animals undoubtedly contracted the disease after leaving the Free State, and apparently through contact with Northern Ireland infected animals in England.

"'The problem, therefore, of determining the manner in which the disease was conveyed to Ireland resolved itself into ascertaining the origin of the outbreak on the first farm.

"'A careful examination of all the relevant circumstances showed that before May, disease in an infective stage did not exist on the farm, but that during the last two or three days of May and the first two or three days of June infection existed.

"'Allowing therefore for the usual period of incubation, it seems certain that the virus of the disease was introduced to animals on the farm during the few days before May 27th, although by that date and until some time after there were no clinical signs of disease.

"'The most exhaustive inquiries failed to bring to light any source from which during the period indicated the virus could have been introduced, with, however, one important exception. On May 22nd Dutch cauliflowers were brought to the farm.'"

Immunisation against Snake Venom.

"Once again the annual report of the Walter and Eliza Hall Institute of Research in Pathology and Medicine* deals at considerable length with the investigation of Australian snake venoms," says the *British Medical Journal* of December 5th. "Although financial stringency has compelled the Commonwealth Department of Health to withdraw its grant, rigid economies at the Institute have made it possible to continue the various researches. The cost of venom collection and of the preparation of antiserum at the Commonwealth serum laboratories is still being met, though with difficulty. An attempt was made last year to ascertain whether the serological blood relationships of some Australian snakes could be used to confirm the morphological findings in the differentiation of closely allied venomous species, and the specificity of the precipitin and complement-fixation reactions has been explored. Neither of these methods in its simple form was found to permit the differentiation of species, the precipitin tests in particular proving to be widely non-specific, especially when strong antiserums were used. The complement-fixation test proved to be rather more specific, and the results yielded were in accord with the zoological findings. Hæmagglutination does not appear to be much more specific than the two previous tests, but further studies are being undertaken to determine its value more exactly.

Earlier experiments upon guinea-pigs immunised with a number of venoms had suggested that active immunity in this species was less specific than the passive immunity conferred by the injection of monovalent antivenene. Groups of rabbits immunised against the venoms of the tiger snake, copperhead, and death adder respectively were found to exhibit a higher degree of non-specificity than could be explained by the action of circulating antibodies. In the attempt to explain this phenomenon it was shown that venoms closely allied to those used for immunisation could function as secondary stimuli in these immune animals. It appeared doubtful, however, whether the time needed for this response was enough to account for the observed non-specific protection; it was certainly insufficient when death-adder venom was used for testing. It was finally suggested that an additional factor in immunity might be the accumulation of antibody in the tissue spaces round those cells which were peculiarly liable to attack.

"Another line of investigation was indicated by the fact that the Australian venomous snakes, and, to a less degree, some non-venomous ones, possess an extremely high immunity to Australian venoms, but are susceptible to the action of cobra venom. This immunity is in striking contrast with the susceptibility of mammals, and cold-bloodedness can be excluded as the prime cause of the difference. Various theories have been put forward to account for this, and it has been suggested that venom, or its constituents, are constantly, or intermittently, present in the circulating blood of these snakes. It has been made clear that they have an immunity to neurotoxin and thrombin, but no evidence of either of these substances could be found experimentally in the plasma. One hypothesis, which has not been presented before, is that the venom gains entry to the blood stream by self-inflicted bites, or by the bites of other snakes, and that a process of survival of the fittest has resulted in the development of immunity. Whatever the mechanism may be, it is clear that the most important factor in developing the immunity of snakes to their own and to allied venoms is a natural immunity of the tissues of the central nervous system, which allows them to withstand even high concentrations of venom for a long time. Since even large doses of venom cannot act as specific secondary stimuli, the antitoxin immunity of snake plasma is unlikely to be of the same nature as that developed in mammals in the course of active immunisation."

* Melbourne: J. C. Stephens, Ltd.

Notes and News.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Dec. 14th.—N.V.M.A. Editorial Committee Meeting at 2 Verulam Buildings, Gray's Inn, W.C.1.

R.C.V.S. Obituary.

Aitken, John, White Hart Street, Dalkeith. Graduated New Edinburgh, July 22nd, 1880. Died December 1st, 1931, aged 73 years.

Barnes, Henry James, 25, Sydney Road, Enfield, Middlesex. Graduated London, April 1st, 1873. Died November 28th, 1931.

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The Late Mr. John Aitken.

In reference to the death of Mr. John Aitken, M.R.C.V.S., *The Scotsman* says: "For many years Mr. Aitken had had an extensive and wide practice in Midlothian. He was the third generation of a family of veterinary surgeons, his father, who died in 1915, aged 95, being then the oldest member of the profession in Great Britain. Mr. Aitken, who had held various public appointments, retired at the beginning of the present year. He had lately enjoyed indifferent health. He was 73 years of age and unmarried."

Personal.

Wills.—Catmur, Major Robin, M.R.C.V.S., of Abingdon (net personalty, £5,143), £8,770.

Robinson, Mr. George, M.R.C.V.S., of Chesterfield, veterinary surgeon to the Chesterfield Corporation since 1915 (net personalty, £776), £837.

Army Veterinary Service.

Brigadier A. J. Williams, D.S.O., the Director of Veterinary Services at Army Headquarters, India, is to come home on two months' leave from December 10th.

Free State Register of Veterinary Surgeons.

The Free State Minister for Agriculture has notified in *Iris Oifigiuil* that the Register of Veterinary Surgeons for the Free State will be established as, on and from January 1st, 1932, in accordance with the desire of the Veterinary Council.

H.M. Stationery Office Publications.

The undermentioned have been published recently. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28, Abingdon Street, S.W.1; Cardiff: 1, St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120, George Street.

	Price Net.	*Post Free.*
	s. d.	*s. d.*
House of Lords Papers and Bills:—		
(13) Veterinary Surgeons (Irish Free State Agreement) Bill. (H.L.) ...	0 2	0 2½
House of Commons Reports and Papers:—		
126. Development Commission. Twenty-first Report of the Development Commissioners for the year ended March 31st, 1931	4 0	4 4
House of Commons Reports and Papers:—		
Rabbits Bill and Slaughter of Animals Bill. Report of Proceedings of Standing Committee A	0 3	0 3¼
Statutory Rules and Orders:—		
942. India. Superior Civil Services Rules. Amendments made October 13th, 1931	0 6	0 7
Agriculture and Fisheries, Ministry of:—		
Bulletins:—		
6. Some Diseases of Poultry. Second Edition. August, 1931. (24-122-6-31)	0 8	0 10
31. Studies concerning the Handling of Milk	2 0	2 3
Research and Education Division:—		
Report on the Work of the, for the year 1929-30 (24-81-0-30)	1 3	1 5
Medical Research Council:—		
Special Report Series:—		
160. Medical Uses of Radium. Summary of Reports from Research Centres for 1930. (45-5-60-0) ...	1 0	1 2

Hunter Show Certain.

Faced with the withdrawal of the grant of £30,000 from the War Office, the Hunters' Improvement Society's Council on November 20th considered whether it would be possible to hold a show in March. The Society has already engaged the Royal Agricultural Hall for the show, and entered into other obligations, and the Council decided that a show will be held, and it is hoped to embrace classes for stallions.

Sir Walter Gilbey reported that a deputation had waited upon the Secretary of State for War in regard to the withdrawal of the Light Horse Breeding Grant, and had stated the position very fully as affecting stallion owners, breeders, farmers, grooms and agriculturists generally, but no reply had yet been received. The Council felt that it was difficult to draft the schedule for the show until such reply had been received, and thereupon appointed a Committee with power to act, to meet on December 9th to make all arrangements.

Horse Brings Aid.

"Boys playing in a quiet square in Ballyconnell, Co. Cavan, were suddenly startled by the sound of galloping hooves," reports *The Meath Chronicle*. "Then a riderless horse appeared, cantered around the square, and stopped in front of the boys, as if trying to attract their attention. The horse now turned down a road leading out of the town, glancing back every now and then to see if the boys were following. It led them for half-a-mile down the road, and then stopped beside a ditch, where the boys found George Doyle, a jockey, lying unconscious with his head almost buried in the mud. They pulled him out of the mud, and one of them ran for a doctor. When Dr. O'Rourke, of Ballyconnell, arrived and attended to Doyle, his horse became perfectly calm. Doyle, who had been riding the horse out for training when he met with the accident, is making a good recovery."

Lachrymal Duct Obstruction Test.

The lachrymal canal in the dog occasionally becomes obstructed, causing tears to flow over the animal's face and this in time discolours the skin. It it impossible to probe the canal throughout its entire course to determine whether it is patent or obstructed, hence German veterinarians have developed a unique method of determining patency. They introduce a bitter fluid that is harmless to the tissues involved, into the conjunctival sac, such as dilute tincture of opium. If the canal is open the fluid will pass down through the duct, enter the nares and pharynx, causing the dog to make grimaces and to salivate. If obstruction is incomplete, the interval between instillation of the fluid and the patient's reaction to the same is prolonged; and where the canal is completely closed no "tasting" manifestations nor salivation take place.—*N. Am. Vet.*

Ayrshire Milk Yields.

Ayrshire cattle have lately won much popularity in the South as milk producers. It is an interesting reflection of this development that the honour of developing the highest milk recorded Ayrshire cow in Great Britain now comes to an English farmer, Mr. C. G. Vyner, of Studleigh Royal, Ripon. The record-breaking cow is Cowden's Gem 2nd, bred at Lockerbie, which has given 22,073½-lb. of milk in the last milk-recording year, with a butter fat percentage of 3·65.

Colour and the Aberdeen-Angus.

"One of the characteristics, and one of the most valuable qualities of the Aberdeen-Angus bull is that no matter what breed of cows he may be mated with he leaves a very large percentage of his calves black or blue-grey and hornless," says *The Scottish Farmer*. "This rule, however, is not invariable. Aberdeen-Angus bulls with white socks or with a considerable amount of white on the underline are not unknown even at the sales of pedigreed bulls held under the auspices of the breed society; and it is not remarkable, therefore, if calves with white markings are left occasionally. An interesting case arising out of coloured calves being left by an Aberdeen-Angus bull came before Judge M'Elligott in Limerick Circuit Court on November 10th. The plaintiff, who alleged 'fraudulent misrepresentation,' sued the defendant for £250 damages for having sold him an Aberdeen-Angus bull which defendant had represented was a pedigree bull, but which had left calves of varied hues. Of 30 calves born, it was stated that only four were black. Witnesses spoke of the calves being of every colour—yellow, black and yellow, black and white and pale red were among the colours mentioned; and the plaintiff, who had been threatened by neighbours who had had the use of the bull, stated in reply to a question, that 'any pure-bred Aberdeen-Angus bull is supposed to bring black calves.' After hearing both sides, the judge found for the defendant. He was satisfied that the bull was a pedigreed bull bred by a well-known breeder. He understood that the plaintiff was annoyed that the bull was not a success, 'but even in the best regulated herds an inferior article was sometimes bred and sometimes sold.' Fortunately cases of this kind are few. The great majority of Aberdeen-Angus bulls—probably over 95 per cent.—leave black and blue-grey polled calves. Were it otherwise the Aberdeen-Angus would not occupy the place that it does as a crossing sire."

Concerning Milk.

A report recently issued by the Empire Marketing Board states that in this country 23 gallons of milk per head of the population were sold during 1930, and this figure included milk sold to factories for conversion into cheese. The yearly consumption of milk in other countries is stated to be as follows, *viz.*, United States, 46 gallons per head; Switzerland, 83 gallons; Sweden, 68 gallons; and Denmark, 57 gallons. Only in France and Germany is the consumption as low as it is in England.

Commenting on the dietetic value of milk, the report states that it is the cheapest source of high-grade protein and when fed with other foods in right proportions has a specific influence beyond its caloric value, especially on growing children. As far as experiments have shown, pasteurised milk has the same food value for adults as raw milk, save that some observers have found that vitamin C is destroyed. This vitamin is, however, easily replaced by adding small quantities of orange or swede turnip juice. For children under six years of age raw milk might hold a definite advantage.

The report points out that the sale of milk by volume clearly results in under-payment of the farmer who produces milk rich in fat and casein. In New Zealand and Holland dealers pay for milk on the basis of its butter fat content, but it is suggested that payment would much more fairly be made on both casein and fat. The new system of payment might be worked out in consultation with representatives of milk producers and dealers, and the purchasers would pay for what they really want, the nutrient contents of the milk. If this method of payment could be adopted, prosecutions for adulterated milk would be rare, since watered milk would fetch a considerably smaller price than normal milk.—*Jour. Inst. Hyg.*

Home Pig Production.

For the nine months ended September, 1931, the imports of foreign pork to this country amounted to 261,460 cwt., or some 30,000 cwt. more than during the same period of 1930. Of this quantity about 90,000 cwt. emanated from countries outside the Empire. Such figures might well suggest that the question of controlling such imports might be seriously considered by the National Government. It may be contended that many farmers are still disinclined to recognise the potentialities of organised pig production. And there is sound ground for such an impression when one recalls how badly some of those who organised bacon-curing establishments for the encouragement of home pig-production fared in their enterprises. The failure was, of course, due to the lack of guaranteed steady supplies, without which no such concerns could hope to succeed. There is no doubt, however, that the main handicap on the home pig-breeding industry has been the immense quantities of pig products which have been imported throughout the year. Scottish pig breeders, at any rate, have had a pretty hard time, and one can understand their hesitation to launch out on extensive production in the circumstances. With some reasonable control of imports, however, there does not seem to be any reason why, with a closer relationship between producer, curer and butcher, the home pig industry should not become one of the most important interests in British farming.—*North British Agriculturist.*

Sheep Scab Control.

A Sub-committee of the Edinburgh Public Health Committee, meeting on December 1st, agreed to attend a proposed conference of local authorities in Scotland with a view to requesting the Ministry of Agriculture to exercise control of sheep scab in a manner similar to the control exercised over foot-and-mouth disease.

The matter arose on a letter from the County Clerk of Berwickshire, intimating that it was proposed to call the conference, at which it is understood a resolution will be moved urging that "the time has now come when the vexatious restrictions on the movement of sheep, and the unnecessary double-dipping of clean sheep imposed by so many local authorities in England, especially against sheep entering their areas, should be stopped by the Ministry of Agriculture taking control of all sheep scab regulations."

The resolution further suggests that there shall be withdrawn from local authorities the existing powers to make regulations regarding the restriction of movement or double-dipping of sheep entering their areas; and that sheep scab should be dealt with on a similar principle to that of foot-and-mouth disease.

Where British Sheep Excel.

According to the Ministry of Agriculture, the following are some of the principal characteristics which distinguish most breeds of British sheep:—(1) A graceful carriage and springy style of walking; (2) A characteristic head with good depth and strength of jaw and breadth across the bridge of the nose, and full bright eyes, indicating both docility and courage; (3) The neck thick towards the trunk, tapering to the head, arching slightly and not too short; (4) The chest broad, deep, and projecting well over the fore legs, and descending from the neck in a perpendicular line; (5) The back broad behind and before (except in the Cheviots, the Lonks, and the Herdwicks), which have sharp shoulder tops or wethers, with a uniform covering of flesh, not boggy, but to the touch firm and muscular; and under lines straight; (6) The ribs well sprung, rounded

and deep; (7) The shoulders well laid and covered with firm flesh, and regions immediately behind shoulders filled up; (8) The thighs and gigots, arms, and fore flanks fleshed well down; (9) The rump well developed, though not too large, as is sometimes the case in Cotswolds, Border Leicesters, and other heavy-fleshed breeds; (10) The quarters long and not drooping behind, and spaces between them and the best ribs short; (11) The legs straight and well set apart, not too long; the bone clean and fine, and neither coarse nor deficient; hocks slightly out than at all in—or cow hocked; (12) The characteristic wool of the special breed covering well the body, and particularly the belly or the scrotum of the ram.—*North British Agriculturist.*

Increase in Welsh Sheep Population.—Latest returns from Cardiganshire show the present number of sheep in the county to be 297,318, as compared with 273,066 in 1930. Of this total 143,852 sheep have their feeding ground upon the foothills of the Plynlimmon range of mountains.

Export of Pedigree Stock.

"It is disappointing to hear that lately there has not been much call on the quarantine facilities which are available for the export of livestock to the Dominions and Colonies," says the Agricultural Correspondent of *The Times*. "During the past three years an average of about 600 head has passed through the London quarantine station, which is under the care of the Royal Agricultural Society. The Australian demand for British stock has fallen off heavily in recent months, though South Africa has taken several consignments. Canada and New Zealand have not yet taken advantage of the quarantine scheme. However, the High Commissioner for New Zealand has recently asked the Society for particulars of the stock dispatched through the quarantine station since it was established in 1928, together with detailed information about the station. It is hoped as a result of the full information given concerning the safeguards enforced, coupled with the first-hand knowledge gained by the Prime Minister of the Dominion when he visited the station last year, that New Zealand will decide to accept this scheme, which has proved so beneficial to other Empire countries."

Dosage of Chloral.—In the abstract of the article by Marcenac and Lemétayer entitled "Anæsthesia in the Horse by Chloral Hydrate given Intravenously" published in our issue of November 28th (p. 1211, col. 1), where it is stated that chloral ʒiii is a sufficient dose for a horse weighing 12 hundredweight, for ʒiii read ʒxii.

Correspondence.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

Bovine Tuberculosis in Man.

To the Editor of The Veterinary Record.

Sir,—May I draw the attention of your readers to the importance of the Memorandum on Bovine Tuberculosis, published by the Ministry of Health, and which you are publishing in the *Veterinary Record*, commencing with last week's issue (December 5th). Especially would I refer them to Table III and the remarkable figures of Dr. A. S. Griffith given therein which have been brought up to date. The figures imply that practically *half* the cases of cervical gland and skin infection are of bovine origin and these figures cover human beings of all ages. Other figures, such as those relating to *post-mortem* findings, are nearly as remarkable.

Hitherto, human medical practitioners have been inclined to belittle the part played by the cow in infecting the human being; however, Table III of the Memorandum reveals a regrettable position regarding this matter. Especially is this the case inasmuch as it would be possible of rectification at comparatively small expense when taking into account the money that would be saved by hospitals and institutions now treating patients infected with bovine tuberculosis. Children are the greatest sufferers.

Yours faithfully,

William S. Stevens.

December 6th, 1931.

Diseases of Animals Acts, 1894 to 1927.

SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic Mange.§		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks reported by the Local Authorities.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16 to 30 November, 1931	15	15	—	—	2	3	21	86	38
Corresponding period in—									
1930 ...	19	22	—	—	2	3	27	95	43
1929 ...	15	18	1	60	4	8	60	198	113
1928 ...	18	20	2	172	9	60	65	50	25
Total 1 Jan. to 30 Nov., 1931	425	473	97	10,257	128	226	266	1,805	761
Corresponding period in—									
1930 ...	338	382	8	306	186	281	388	2,240	1,005
1929 ...	405	494	36	3,448	189	371	511	2,644	1 542
1928 ...	489	566	133	11,109	251	516	539	1,380	697

Note.—The figures for the current year are approximate only.